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ABSTRACT

The deliberations of representatives from eleven Asian Unesco member countries focus on alternative approaches to identification of needs and resources as a basis for curriculum development, strategies and methodologies adopted in translating the curriculum into teaching learning materials and learning aids, training of teachers, problems involved in the development of instructional materials, and mechanisms for evaluation and renewal of materials and programs. The experiences are indicative of a variety of approaches, combining traditional learning resources with more sophisticated modes of communication. Discernable new trends emphasize community participation and leadership, interagency and interdisciplinary cooperation, the use of environment as a resource for learning, and the incorporation in project design of assessment and reconstruction mechanisms. The report presents: highlights of experiences in the development of instructional materials in Bangladesh, India, the Philippines, Thailand, the Republic of Korea, Nepal, Pakistan, Sri Lanka, Indonesia, Iran, and Malaysia; a summary of visits to two selected Thai secondary schools and a teacher training institution to observe implementation of curriculum in health/nutrition, skill training, and rural development; a synthesis of guidelines using local and community resources and printed and other materials to prepare curriculum materials; the conference agenda, a list of participants, and a list of conference related documents. (NEC)

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APEID ASIAN PROGRAMME OF EDUCATIONAL INNOVATION FOR DEVELOPMENT

UNIVERSALIZING EDUCATION: Strategies for the Development and Use of Instructional Materials

Report of an APEID Study Group Meeting

UNESCO REGIONAL OFFICE FOR EDUCATION IN ASIA AND OCEANIA
Bangkok, 1979

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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INTRODUCTION

Background

Realizing the importance of developing instructional materials and educational aids, particularly those which are produced from local and community resources, both human and physical resources, and the use of indigenous materials in several areas of innovation including: i) curriculum development; ii) education of teachers, teacher educators and other educational personnel; and iii) science and technology education, the Asian Centre of Educational Innovation for Development (ACEID) organized a Study Group Meeting from 4 to 19 December 1978 at Udorn Thani, Thailand.

The focus of the instructional materials was on facilitating educational changes for contributing towards several development themes, namely:

1. Integrated rural development;
2. Development of productive skills relevant to economic development;
3. Universalization of education;
4. Better health and nutrition; and
5. National unity and international understanding and co-operation.

Objectives

The specific objectives of the Study Group Meeting were:

1. to identify the elements of core curriculum for integrated rural development;
2. to analyze the strategies used in the design, development and use of curriculum materials teacher education materials and science instructional materials;
3. to develop guidelines for the design, development and use of instructional materials for curriculum development, teacher education and science education as they relate to integrated rural development;
4. to draw guidelines for improvement of existing practices in the design, development and use of materials; and
5. to recommend ways and means of facilitating inter-country co-operation and exchange of experiences on the subject.

The agenda of the Study Group Meeting is presented in Annex I.

Participation

Twenty-two participants from eleven Unesco member countries attended the meeting: one each from Bangladesh, Indonesia, Iran, Nepal and Democratic Socialist Republic of Sri Lanka. Two each from Malaysia and Pakistan; three each from India, Republic of Korea and the Philippines; and four from Thailand. The ACEID were represented by Specialist in New Methods in Teacher Education and Specialist in Curriculum Development. The list of participants is presented in Annex II.

Inauguration

The Meeting was inaugurated by Mr. Somchai Wudhipreecha, Deputy Under-Secretary of State for Education, Ministry of Education, Thailand. Mr. Wudhipreecha extended his warm welcome to the participants, stressing the significance of the Meeting and the interest of the Thai Government in providing support to APEID programmes. Mr. Thongdam Banchuen, Deputy Governor of Udorn Thani province, delivered the welcome address, hoping that the participants would enjoy their stay in the city and that the Meeting would be a successful one. Dr. A. Latif, Chief of ACEID, conveyed a message from Mr. Raja Roy Singh, Director of the Unesco Regional Office for Education in Asia and Oceania, Bangkok, and explained the salient features of the Asian Programme of Educational Innovation for Development (APEID), and the background and objectives of the Study Group Meeting.

Officers of the Meeting

The Meeting elected a chairman, four vice chairmen and three rapporteurs. Names of the officers for the meeting are as follows:

Chairman

Dr. Thanoo Swaengsakdi (Thailand)

Vice Chairmen

Prof. B. Ganguly (India)

Dr. Masood Sadrol-Ashrafi (Iran)

Dr. Sang Ho Kim (Republic of Korea)

Mr. Mohammad Aslam Popalzai (Pakistan)

Rapporteurs

Dr. Rosalina R. Villavicencio (Philippines)

Mr. S.B. Ekanayake (Sri Lanka)

Dr. Kingfa Sintoovongse (Thailand)

The participants divided themselves into two groupings, one on synthesis of experiences and the other on preparation of guidelines, each consisting of three groups. The list of group members by the two different groupings are found in Annex III.

Activities of the Study Group Meeting

In their deliberations, the participants undertook six activities.

1. Presentation and discussion of individual reports of experiences on the development of curriculum materials, teacher education materials and science instructional materials;

2. Visit to two schools and one teacher training college to observe projects and activities related to health/ ntrition, skill training and rural development and the development of curriculum materials using the available local resources;

3. Group discussions on the different kinds of instructional materials developed by the participants;

4. Group discussions and preparation of guidelines on the design, development and use of instructional materials for curriculum development, teacher education and science education;

5. Preparation of plans for improving current practices in the participants country or institution. This activity, however, is not included in the report; and

6. Make suggestions for further strengthening of inter-agency/ inter-country co-operation and exchange of experiences in the areas under consideration.

At the end of the Meeting, the participants prepared two separate volumes of report; a) a draft report on the activities of the meeting and b) a portfolio of experiences of participants in developing curriculum materials. The draft report was discussed and adopted in the closing session. This document is the final report of the Meeting. The portfolio of experiences will form a separate publication.

Chapter I

HIGHLIGHTS OF EXPERIENCES IN THE DEVELOPMENT OF INSTRUCTIONAL MATERIALS

It has been observed and expressed that economic growth in the last thirty years has failed to affect the villages and the poorer sections of urban areas. This has developed a feeling among the people that education has nothing to do with their lives. To answer the question of relevance in education in rural development considerable efforts had been exerted in the past years.

Recently, the attention of international and national agencies to rural development has focused on the vital role of education to national development. Hence, the relevance of education to rural life touched on the aspects of the core-curriculum, teaching strategies and methods, and the quality of teachers.

The experiences of the participants from the eleven member countries in developing instructional materials for rural development were presented in two plenary sessions. The papers were classified into three broad categories based on the nature of the materials developed.

Group A. Local and Community Resources;

Group B. Printed Materials; and

Group C. Other Materials (printed or non-printed materials covering modular, self-learning kits, etc.)

The highlights of experiences of participants in the light of developing instructional materials are as follow:

Group A. Local and Community Resources

Bangladesh

Experiences of Bangladesh in Developing Curriculum Materials for Rural Education (by Mrs. M. Islam)

A. Methods to identify the elements of the core curriculum for integrated rural development

The government set up an Education Commission to examine the various problems of educational development and to prepare a comprehensive report on the possible reforms. The report of the commission identified that education could be done in the formal and non-formal systems. The core elements include the development of useful citizens with the necessary skills for future life in the community.

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B. Strategies, methods, and institutional arrangements in conducting programmes for rural development

Several institutions had been involved in rural development programmes, namely; the Bangladesh Academy for Rural Development, and the Integrated Rural Development Programmes. The Bangladesh Academy for Rural Development took the initiative to train teachers, revise syllabus and prepare text materials for agriculture at the primary level. Agriculture, then became a curricular subject in the science syllabus.

International, national and local agencies have helped establish resource centres engaged in curriculum development work through the Village Education Resource Centre (VERC), which has developed curricula and teaching techniques, instructional materials, aids, and equipment from local resources. They have developed a village planning kit, needs assessment card series, set of sound slides, illustrated manuals, posters, educational toys, tool sets and technology models used in school and community situations. The Bangladesh Rural Advancement Committee (BRAC) developed a model set of fundamental education materials used in community schools, youth centres, and mothers' clubs. The BRAC model set consists of 60 lessons with 139 charts, lesson book, teacher's manual and several educational games to reinforce the lessons. They have developed 14 learning modules in colour dealing with material care nutrition, health and family planning, and common diseases.

Other ways to bring children closer to life situations are the open air school at the primary level and the food preservation curriculum for the female students at the secondary level and mothers' club in the community. The latter has recently been modified and revised with UNICEF assistance. The curriculum for these strategies were developed by the curriculum design specialists, advisers and technicians in the Ministry of Education and the local government for community development.

C. Training of teachers and other personnel on the use of materials

There is a training component in the curriculum on food preservation for female students in the secondary level and the women's club. The content of the training programme includes: nutritional status of the people of Bangladesh, seasonal supplies of food, methodology of preserving acid and non-acid fruits and vegetables, demonstration on bottling, preservatives, pickles, chutneys and achars, jam, jelly, squashes, syrup and juices, miscellaneous country procedures of food preservation, food and spices packing, and plan for a small preservation unit. The training is conducted by the trained personnel in the respective local institutions and the Ministry of Education.

D. Problems encountered in the development of the curriculum materials and training

1. Lack of experience and technical help;
2. Lack of facilities for training;
3. Lack of equipment and supplies;
4. Non-availability of suitable materials; and
5. Lack of funds and administrative support.

E. Mechanism of evaluation

There will be departmental evaluation as well as professional screening of the pilot experimentation from the beginning of the programme. Arrangements have been made for the Research Team to evaluate the first phase of the programme.

India

Teaching through the Environment (by Dr. J.S. Rajput)

A. Methods to identify the elements of the core curriculum

The academic soundness of the environmental approach is established by the mere fact that it is the child's own environment in which the child lives, plays, and learns. As such, it could surely be the most effective way to make the child's learning sound, realistic and effective. The approach cuts across the barriers of subject disciplines and learning takes place across a very broad spectrum. Taking into account the needs of the majority of (rural) children, the National Council of Educational Research and Training (NCERT) prepared a curriculum for elementary stage of education with the following rationale:

1. This is a very crucial stage in the life of the child;
2. The child's spontaneity, curiosity, creativity and activity should not be restricted by rigid and unattractive methods of teaching;
3. The curriculum has to take into account the social, intellectual, emotional and physical maturity of a child and also the socio-economic constraints; and
4. Since for a large number of children, this may be the terminal stage, the education must prepare them for life.

With this rationale, the objectives were defined and these include: literacy, numeracy, and technocracy. Furthermore, the child should develop respect for democratic value systems, acquire healthy attitudes towards human labour and its dignity, appreciate co-operative functioning and working together, and should acquire the habit of self-learning.

The Regional College of Education in Bhopal a Centre of the NCERT undertook a project to identify the use of environment in the core curriculum, weaving learning around the child's natural and familiar environment and preparation of materials for teachers to use the environmental approach to teaching-learning processes.

B. Strategies used in the development of materials

The curriculum developed for the core elements of the environmental studies is based on the social needs, the child's maturity level and the child's interests. The project team divided the topics into smaller

units, made rearrangements wherever necessary and prepared a sequential list of sub-topics. In doing this, it was always kept in mind that the environment is to be used as a means to an end, and the child should be able to work out solutions to the problems he/she is likely to face in life, particularly in the rural context where the drop-out rate at school stage is very high. The strategies and methodologies could be summarized as follows:

1. It was considered necessary to first identify those local resources in the rural areas which may be of immediate use and help to the child such as sources of water, agricultural products of a particular area, trees, plants, soil, minerals, etc.

2. The in-service teachers from rural areas who come to the institution for correspondence-cum-contact programmes were invited to identify the local resources available in the vicinity of their schools.

3. A compilation of the list of resources was prepared and this indicated certain broad patterns as well as the differences of resources in different regions.

4. Involvement of primary teachers was considered necessary both at the preparation stage of the material and in suggesting/finalizing the activities. The project takes into account the crucial position and the role of the primary/elementary teacher and the conditions and constraints under which he works.

C. Training of teachers for the development of materials

A series of workshops was organized in different places in the western states with the co-operation of the state governments. The school teachers prepared the materials suitable for their own area. These groups of teachers also worked out the functions that are expected to be performed by the teachers. Apart from the teacher, help was enlisted from the community; the carpenters, potters, balcksmiths, the village priests, and others depending on the aspect of environmental studies were involved. The teachers gave several suggestions regarding the teacher training programmes both for in-service and pre-service education. The college has instituted a special pre-service graduate training programme: Bachelor of Education (elementary education) and the course content has been suitably modified. During the in-service training programmes, emphasis was given to performance of activities by the teachers themselves and in suggesting alternatives in case any of the components involved is not locally available. They decided and discussed the approach in each specific topic, and also suggested and evolved the methodology to be followed by them in their own school. They listed the items required and the resources to be tapped. Finally the instructional materials were prepared within the broad framework of concepts, teacher-pupil activity, environmental aid, concepts related to other areas and also the help required from other sources including the community.

D. Problems encountered during the development and use of the materials

The teachers face the problems of getting reference materials and even the need of consultation regarding some of the activities they may be planning. The college project group helps in such cases. The teachers also face the administrative bottlenecks in carrying out the instructional work according to environmental approach due to the rigid framework under which the schools function. All the teachers are to be equally motivated to take up the new tasks and particular care has to be taken in some cases.

E. Mechanism of evaluation

The existing evaluation system consists of terminal evaluation at the end of the year only. It is not in consonance with the spirit of the approach. For the time being, wherever possible, a compromise has been made in terms of fifty per cent weightage to continuous evaluation and remaining fifty per cent for the terminal evaluation. The project team is also associated with another innovative science teaching programme - Hoshangabad Science Teaching Programme (HSTP) which follows a similar approach. The state government has permitted evaluation of the children in the HSTP by the project group instead of the state-controlled examination board. The HSTP is at present being followed in 206 schools in grades VI, VII and VIII. Several experts, institutions and agencies are assisting the teachers in this project. The state is also taking up a similar programme in four other districts in selected schools. These districts have been selected on the basis of the specific distinct local resources. The materials in such cases are being printed and distributed by the state. The college project group is associated in both programmes.

The testing of materials comes in the shape of classroom teaching by the elementary level teacher. This includes performance of activities by the pupils and the observational evaluation by the teacher. Usually, the class consists of forty to fifty children and he has difficulty of assisting such a large number of students. Possibility of taking assistance of other teachers who may volunteer was considered and worked successfully in most cases. Actual time required for any unit and activity contained therein could be decided only after classroom trials. The other alternative was to redesign the activity or regroup the class to enable every student to participate actively.

While designing an activity, the related skills that may be necessary should be considered. While the activities were being performed, it was found that certain points that need to be emphasized may be written on the blackboard to focus the attention of the students. In certain cases, it was found that even after successful completion of the activity, the child may not be able to appreciate the logic and concepts involved therein and the teacher will have to make sure about the same.

Development and use of instructional materials

The project envisages a series of workshops for teachers every year. These will include those who are already taking up the material in classrooms and those who still use the materials when the project is extended. While the former renew the material based upon their experiences, others try to understand the approach and redesign the same for their own region. The project envisages to achieve the objectives of creating interest in vocations locally available, develop appreciation for the process of science, inculcate the habit of using natural resources wisely, and to develop scientific attitudes. It is necessary to provide such functional education at this stage which will help the citizens in real life situations.

Philippines

Experiences in Developing Exemplar Teacher Education Materials for Environmental Biology (by Mrs. Lucille C. Gregorio)

A. Methods to identify the core elements in the teacher education materials

The competency courses for science and mathematics teachers offered by the University of the Philippines Science Education Centre (UPSEC) are based on the idea that the Centre can strengthen its efforts on improving science and mathematics education. The courses are intended to bridge the gap between possible innovation in science education and its innovation dispersed between theory and practice.

An "Inventory of Science Teaching Competencies" was published by the UPSEC in May 1978. The inventory is intended for teachers, teacher-educators and teacher-training institutions. It can serve as a checklist for the teacher, to help him determine which competencies he does not possess and, therefore, work towards their development. It can also be used by science educators or science institutions to examine their programmes in order to determine whether or not these programmes provide prospective or in-service teachers with the necessary competencies which will enable them to "do science" rather than "talk about science" to their students. The subject areas covered in the inventory are biology, chemistry, earth science and physics.

B. Strategies used in developing teacher education materials

Several competencies are needed by a biology teacher. The Biology Workgroup of the UPSEC prioritized these competencies, and this priority-setting became the basis of the short-term (competency) courses for pre-service and in-service teachers.

The biology workgroup has so far developed the following courses: (i) Techniques in ecological study for high school biology in three parts, namely: grassland, freshwater and marine ecosystems;(ii) Collection, identification and preservation of plant materials; (iii) Culture, identification and preservation of protista and other small organism; and (iv) Collection, identification and preservation of animal specimens for high school biology. These courses are offered for two weeks. In terms of the other competencies needed, more short-term courses are being developed by the workgroup.

The first two courses mentioned in (i) and (ii) above have already been offered. They were held outside the classroom, except for a few lectures. The teacher-participants were given the opportunity to use secondary level activities by playing the role of biology students. They were also given tips on improvization of equipment from materials which are locally available. Using the strategy, the teacher participants become better prepared to go back to their schools to hold echo-seminars or teach in summer institutes.

The workgroup has also launched a project entitled "Using the Environment as a Teaching Resource". The results of this project will be a set of materials to be used in the study of a particular ecosystem. These supplemental materials are intended for teachers as a source of information designed to improve their competencies and also to involve students in outdoor activities for a study of living things in their environment. The first set of materials called Grassland Ecology will consist of: (i) Handbook of common methods used in studying the grassland; (ii) Guidebook to common plants in the grassland; and (iii) Guidebook to common animals in the grassland.

Other supplemental materials for the teaching of environmental biology, published by the Centre are Plants of the Philippines published in June 1971 and Philippine Birds and Mammals published in July 1977.

C. Role of teachers in improving the courses and materials

At the end of the short-term courses, teaching strategies, appropriateness of teaching aids, economic soundness, durability of component materials and timing of the courses were evaluated by the participants. The evaluation gave the workgroup ideas on how to improve the courses. The materials used in these courses will be printed to form part of the teacher education materials.

The activities in the resource materials developed are being tested in some selected biology classes in the University. The teachers doing this are expected to give feedback about the materials which will be the basis for improvement.

D. Problems on the development of teacher resource materials

The problems met in the development of teacher resource materials are: (i) the lack of basic biological research in the Philippines from where examples can be drawn; (ii) too much to do for a limited number of manpower; and (iii) insufficient training and background of teachers in the subject area. On the competency courses, only a few teachers have a change to attend because of financial constraints and teachers have heavy schedules of classes and schoolwork.

E. Mechanism of evaluation

The competency courses are evaluated by the participants themselves. At the end of each course, the Evaluation Workshop of the Centre gives out an open-ended questionnaire to the teachers. The questionnaires include queries about th appropriateness of the teaching strategies, teaching aids used in the course, economic soundness and durability of component materials and duration of the course. The participants are

also asked to state what they like best or like least about the courses, and they also give recommendations for the improvement of the courses.

The resource materials are evaluated in the form of written comments from the users. There is no formal evaluation.

The resource materials are beneficial to teachers, students and ordinary people from the rural, urban and metropolitan communities. It gives scientific and practical information on ecology, equatic and terrestrial biology, and conservation of natural resources.

Philippines

The Comprehensive Community Health Programme: Its Role in Training for Rural Development (by Dr. Sergio Gasmen)

In 1965, the Comprehensive Community Health Programme (CCHP) was started in the Province of Laguna, Philippines as an answer to the need for relevance of education, especially the health sciences, to the needs of the country.

Initiated by the College of Medicine and the College of Agriculture, it became an inter-disciplinary university programme involving other disciplines from other institutes and colleges of the university. It also involved other agencies of the national government, especially the Ministry of Health with which the university has forged a Memorandum of Agreement to work together in training, research and extension services.

In terms of training, the CCHP handles both professional and para-professional training programmes for students from the health science and related professions and community participants, respectively.

A. Methods to identify the elements of the core-curriculum

1. Professional training programme

Teaching activities involved the placement of students in the communities as their extramural laboratories. This resulted to designs of curriculum departing from classroom teaching and changes in the over-all curricula offerings of mother units (e.g. College of Medicine, College of Nursing, etc.) participating in the programme.

Curricular development met some problems such as initial differences in ideas resulting from the differences in concepts of the participating disciplines. This was finally resolved through an Inter-disciplinary Curriculum Committee, and through consultations with mother units about what are expected by each unit regarding field placement and what preplacement capabilities of students should be in the responsibility of the mother units. Students and community participants were also asked by the staff as sources of the curriculum development.

The main criteria for identifying the elements of the core curriculum is, what will be learned that will not only make the student more competent professionally to work in a rural area, but also to make him more responsive to the needs of the people.

These common elements are those related to community work skills; interdisciplinary and teamwork skills; skills in community diagnosis; health project planning and management; and the corresponding knowledge and values that go with the skills. Special elements are those that are peculiar to a particular discipline, for example, medicine.

2. Para-profesional training programme

Elements of the core-curriculum were usually identified through action-research programmes in response to some critical factors hampering the delivery of health care service to the rural area. An example given is the Pharmacy Aides' Training programme that came out of action, research, consultation with community people, key leaders, local practising private pharmacists, and the faculty members of the College of Pharmacy, and from the members of the interdisciplinary staff of the Comprehensive Community Health Programme. The common elements are basic pharmacology techniques in drug dispensing drug education; drug inventory, sales recording and accounting; simple clinical assessments and first aid; and some tips on community development techniques.

B. Strategies and methods in translating core elements to learning-teaching situations

Core elements of the curriculum for both professional and para-professional training programmes lend themselves easily to translation to learning-teaching situations by the nature of the core elements themselves, i.e., they require exposure of students to the community - its environment and people. Particularly in para-professional training programmes, previous experiences showing that practicum as a most effective strategy had led to translate core elements towards this direction.

Several examples of learning-teaching situations were expounded to show the relationship of the core elements to teaching-learning situations in the real setting at the community.

C. Training of teachers and other personnel in designing, use, and improvement of the materials used

Training is intended for several groups: (i) the CCHP staff and faculty members; (ii) the students coming from the various health science and related disciplines who help as trainers for para-professional training programmes; (iii) the community resource persons who also help as trainers for the para-professional training programmes; and (iv) graduates of para-professional training programmes who are being trained to become trainers of other professionals.

Training is in the form of seminar-workshops, informal consultations, and most important, through constant sharing of experiences through regular conferences and meetings.

D. Problems and issues encountered in the development and use of materials

These problems are categorized as follows:

1. Problems related to students, such as "cultural shock";
2. Problems related to the community as a resource for teaching-learning situations such as "saturation", changing dynamics of community life; and the feeling that they are being "practiced on" by the students;
3. Problems related to teacher preparation, such as the felt need by the staff for more skills in training techniques;
4. Problems related to inter-agency collaboration, such as initial difficulties in implementing joint projects;
5. Problems related to the link between formal and non-formal education, such as upward mobility of para-professional graduates;
6. Problems related to non-utilization of skills after the training programme;
7. Problems related to identifying the best modes of communication to implement training programmes;
8. Problems related to integrating local concepts of health, nutrition and diseases with modern concepts; and
9. Problems related to use of trainers' manuals.

Specific strategies have been used for each problem, although a built-in strategy to solve all these problems has been pointed out. The continuous interactions of the training staff with the community have made them sensitive to local frames of references; local modes of communications; local concepts of health, nutrition, diseases; and socio-economic aspects of community life. The knowledge and experiences are used in establishing strategies to develop materials for training programmes.

E. Mechanism of evaluation

Continuous evaluation of the curriculum is done through structured questionnaires answered by students and the community people, particularly foster families. It is also done through community and faculty meetings. All of the feedback are collated by "monitors" and "preceptors", and the findings are presented to the Inter-disciplinary Curriculum Committee for recommending changes in specific methods as might be necessary.

Thailand

Experiences in Developing Instructional Materials for Teacher Education: A Case Study of the Udorn Thani Teachers' College (by Mr. Supol Wuthisen)

The case study on experiences in developing instructional materials for teacher education of Udorn Thani Teachers' College was an outcome of an experimental project on rural teacher training entitled "The Udornthani Project for Educational Reform by the Means of Teachers' Training (UPERTT)". The students were divided into groups of three members each. Since formal training was done in the Teachers' College, field works were held in different villages in Udorn Thani and Nongkhai provinces under the supervision of the Teachers' College. The experimental project lasted for three years from 1974 to 1976 with 795 students working in 275 villages.

The villages were located in remote areas. During the fieldwork, students found it difficult to have close contact with the Teachers' College because of distance and time constraints. The project, therefore, prepared printed and non-printed materials for distance learning, to be used in the training of student teachers.

A. Methods to identify the core elements of the teacher education curriculum

In order to identify the core element of the master curriculum that can be significantly operational, or to search for criteria in training the student teachers, UPERTT employed the following methods:

1. questionnaires used by in-service teachers and students to 1,400 respondents; and
2. the 795 field-work students during the three-month session.

The experimentation revealed that skills and abilities which the student teachers needed in the field work training were: the ability to live happily in the target community; the ability to teach in schools of that community; and the ability to improve the educational status of the community.

B. Strategies in developing and implementing teacher education curricula

Many types of instructional materials were developed during the experimentation, based on the above three criteria. In addition, the following were considered; the content of the materials, distance and location where they will be used, areas and financial limitations in the preparation. These materials were developed by the Education Extension Centre of In-service Training for Career Teachers. This Centre is another institution's project apart from the UPERTT. The materials developed were:

1. Materials for the enhancement of the ability to live happily in the community, i.e., manual on fieldwork, college newspaper for promoting community education, radio programmes, etc.;
2. Materials for the improvement of the ability to teach in schools, i.e. handbooks for teachers on using local curriculum, learning kits, modules, etc.; and

3. Materials for the improvement of the ability to establish educational environments in the community, i.e., village newspaper, mobile library, radio programmes for villagers, etc.

The master curriculum for teacher training of Teachers' College all over Thailand are specified by the Council of Teacher Training, Ministry of Education. However, in practice, individual teachers' college have to adjust the master curriculum to meet the needs of their particular areas. Therefore, individual teachers' colleges are using their own methods to achieve the objective. Udornthani Teachers' College, makes use of three types of organizations to make the curriculum relevant to the local environment and needs. The first organization is the Office of Academic Affairs under the authority of the Dean of Academic Affairs which supervises the implementation of the master curriculum and compiles the reports of accomplishments, proceedings of academic meetings and suggestions from the central departments. The second organization is the Office of Field-work Educational Service which is responsible for the management of field-work for students and also provides opportunities for maximum participation of college teachers in supervising the operation. The data from the fieldwork and supervision are used by the college as a means to improve the curriculum of the departments concerned. The last organization is the Research and Development Centre which takes responsibility in making follow up of educational movements, surveys and research of its own college and locality. It also conducts experimental projeccts to search for ways to improve the structures and methods of teachers' training in Udorn and Nongkhai provinces.

C. Training of teachers in the programme

Udornthani Teachers' College is now conducting several in-service training activities for teachers and educational personnel under the above project. Through this project, Udornthani Teachers' College has extended its centres to different districts in order to open a wide opportunity for periodic self-improvement of career teachers. The instructional materials developed during the experimentation of UPERTT with the objective of solving the problems related to distance, time and population size have been very helpful to teachers and instructors.

D. Problems and issues encountered

Many types of training materials which were developed for the UPERTT project were found to be very useful but some were still far from expectations.

The manner in which the materials were produced, the utilization of materials, supervision of training programmes, and the quality of the materials need to be improved. There is also a need to develop more training materials for teachers assigned in the field.

E. Mechanism of evaluation

The project was productive in the sense that the student-teacher working for this project were trained to become the change agents for

facilitating better educational opportunities in the rural areas, particularly in Udorn Thani and Nongkhai provinces.

The project was conducted in distant areas of the two provinces. Some villages were located 200 kilometers from Udorn Thani where the main campus is located. There were many types of training materials which required the students to use and evaluate. The feedback helped to facilitate an open communication between students and the training staff.

UPERTT project is now developed and incorporated into the new programme: the Educational Extension Programme for Teachers In-service Training. This programme will train a large number of career teachers in the villages and remote districts without being alienated from their work. As a start, seven centres were opened in November 1978. All the centres are located outside the campus in the peripheral districts.

The locations of the various centres for the new programme imply the necessity for the improvement of the training materials for open/distant learning. All teachers/educators of the Teachers' Training College at Udorn Thani, and resource persons are involved in this programme. It is expected that training materials developed will be geared towards training teachers for the local needs.

The programme is financially viable because the investment made per trainee/student in fieldwork is lower than the cost of operating the regular institution.

Group B. Printed Materials

India

Experiences in Developing Teacher Education Programmes and Science Instructional Materials at the National Council of Educational Research and Training in the Regional College of Education, Mysore, India (by Dr. A.K. Sharma)

Teacher education programmes in India have received national attention for their qualitative improvement only recently when the issues have been put on the anvil of discussion in the National Council for Teacher Education (NCTE). For the NCTE, the NCERT has evolved a framework for teacher education, the various dimensions of which, are currently under review for implementation.

Presently however, the usual curriculum for teacher education operates as follows: for the primary school level (classes 1 to 5), there is a programme of teacher education varying from 1 to 2 years' duration after class 10; for the secondary school level (classes 6 to 10), there is a one year programme (B.Ed.) after the completion of the first university degree in the humanities or sciences; for the higher secondary level (classes 11, 12), hardly any programme of teacher education has been attempted.

The inadequacy of the one year teacher education model for preparing school teachers has been reflected in the following:

1. The entrants to these courses are generally those not admitted to other professional courses, which are invariably the first choice;

2. Nine to ten months of teacher training appears too short a time for inculcating values and skills relevant to the profession;

3. Subject competencies of the entrants are generally not found appropriate for emphasis on pedagogical training; and

4. Role of the teacher as an agent of social change, for all practical purposes is dormant in the curricula.

As an experiment for preparing quality teachers in various subjects, the NCERT started integrated and interdisciplinary models of teacher education as innovative exercises. The special features of such a model of teacher education are given below:

A. Common and special elements in core curricula

The following special elements comprise the core curricula of the integrated teacher education programmes:

1. Integration of content and pedagogy and that of educational theory and practice;

2. Projection of interdisciplinary approach to subjects;

3. More time available for inculcating professional values and developing task-oriented competencies;

4. Organization of student teaching internship to help total development of the teacher;

5. Teaching of workshop skills in carpentry, woodwork, smithy to develop ability in the prospective teacher to improvise/ fabricate apparatus based on indigenous resources; and

6. Involvement in rural schools to provide experiences of the problems of rural development.

The methods and criteria used in identifying the special elements of the curricula were based on the previous evaluation of the teacher training programmes and the decision of the NCERT to experiment with the integrated model as an alternative/additional mode of teacher education.

The M.Sc.Ed. courses in teacher education in Chemistry, Life Sciences, Mathematics and Physics are the first innovative experiments of their kind in the country where relevant courses in education have been

integrated with the M.Sc. level curriculum in the concerned subject. The courses have established their viability for both horizontal and vertical mobility of the prospective teachers.

B. Translating the core elements into teaching-learning materials

In order to translate the core elements of the curriculum into teaching learning materials, programmes related to pre-service and in-service education of teachers have been worked out in different forms. Of particular mention is the in-service teacher education through correspondence-cum-contact programmes, orientation and refresher courses, and through dissemination of resource materials.

The correspondence lessons have been developed by the faculty of the RCE in the following school subjects:

1. Art and Culture
2. English
3. Hindi (as a second language)
4. Mathematics
5. Science - I (Physical Sciences)
6. Science - II (Biological Sciences)
7. Social Sciences - I (History, Civics, etc.)
8. Social Science - II (Geography, Economics, etc.)

The programme involves six months of correspondence instruction followed by two to three weeks of contact sessions.

The Resource Materials have been developed mainly in the science and mathematics by the faculty of the RCE. The main objective of preparing such materials is to assist the teacher both in the content and methodology and they serve both as a Text and Teachers' Guide. Each unit of the Resource Material is developed in the following sequence:

1. A brief introduction;
2. A list of major instructional objectives;
3. A list of key concepts to be developed;
4. Comprehensive development of the subject content;
5. Additional/alternate activities; and
7. A set of questions and exercises.

C. Training of teachers and other personnel in designing, use and improvement of materials developed

Currently the following models of teacher education are being followed in the RCE, at the Pre-service level:

1. An 8-semester integrated Bachelor of Science Education (B.Sc.Ed.) course after class 12 for preparing teachers

in science and mathematics; and also an 8-semester integrated Bachelor of Arts Education (B.A.Ed.) course for preparing teacher of English, for secondary schools.

2. A 2-semester Bachelor of Education (B.Ed.) course with specialization in methods of teaching science, mathematics, English, History, Work Experience/Socially Useful Productive Work, for secondary schools.

3. A 4-semester Master of Science Education (M.Sc.Ed.) course in Chemistry, Life Sciences, Mathematics and Physics after B.Sc. B.Ed./B.Sc.Ed., for preparing teachers for the +2 and the +3 levels of education in the subjects in the pattern of 10+2+3 up to the first degree.

At the <u>in-service level</u>, the following are the on-going programmes of teacher training.

1. Orientation programmes in content-cum-methodology of different subjects as and when the RCE are informed of such needs by the states of the region, through our field offices in each state.

2. Correspondence-cum-contact programmes for secondary school teachers and elementary teacher educators. This is a content enrichment programme to update the teacher with the new curricula in school subjects.

3. Summer school-cum-correspondence course (SSCC) leading to B.Ed. degree; course designed to clear the backlog of untrained teachers working in the schools of the northern region.

D. <u>Problems and issues, and attempted solutions</u>

1. Problems related to the development of courses:

a) The universities go by conventional degree awarding patterns and are generally resistant to grant parity to new and experimental courses on the basis of academic soundness and viability. Through persistent discussion at various levels in the university bodies and by involving university professors in the evaluation of the products of the courses, many issues have been resolved in regard to the academic parity of the courses and worthiness of the programmes.

b) The courses having been established for their academic soundness and viability were expected to be replicated by other institutions. The traditional training colleges cannot add the science component because of cost; the Science and Arts Colleges have not extended the experiment by adding educational component to their institutions.

c) The subject specialist and the method master do not easily come together and the two areas remain compartmentalized hindering improvement of teacher education programmes. This requires appreciation of each area of expertise and is being solved in an understanding spirit.

2. Problems related to development of correspondence materials:

a) The staff involved in developing correspondence education materials and running the programme is the same as that involved in the pre-service courses. In terms of work load, this creates strain. The NCERT is trying to rationalize work for their staff.

b) The problem of identifying areas for developing correspondence material and lack of expertise for writing such materials has led to ascertaining of requirements in regard to teacher education problems in the states. The Centre for Educational Technology (CET) of the NCERT is holding a series of seminars and workshops to train people in writing such materials.

c) The teachers are deputed to this programme; their travelling allowance is borne by the state government; the board and lodging is borne by the NCERT. Since there are no other incentives, by and large, the participation is not voluntary. Some state governments are thinking of helping the teachers in this regard.

d) The communication of correspondence materials is through English which is generally not the mother tongue. The materials are being translated to overcome this natural impediment to learning in a foreign language.

E. Mechanism and procedure for continuous evaluation and periodic renewal of instructional materials

The pre-service and in-service teacher education courses have been evaluated by Review Committee appointed by the NCERT from time to time on the terms of reference provided by the NCERT. Continuance or otherwise of such courses is decided by the recommendations of the committee.

The Physics Resource Material has been validated as an Advanced Curriculum Model of Cognitive Learning on the basis of a research study.

The correspondence lessons have been evaluated (i) in terms of authors' own insight, (ii) feedback from the participating teachers during correspondence instruction and contact programmes and, (iii) comments of reviewers from outside the NCERT.

India

Experiences in Developing Instructional Materials for Integrated Science and Secondary Biology Curricula (by Dr. B.B. Ganguly)

With the introduction of the new 10 + 2 pattern of school education, considerable amount of thinking and rethinking in the area of education are going on in India. Experiences of two programmes, the development of integrated science curriculum and the biology curriculum are presented here as examples. While presenting the experiences of two programmes separately, the problems and issues, the suggested remedies and evaluation procedures of both the programmes have been discussed together.

I. Development of integrated science curriculum

A. Method of identifying elements of the core curriculum

A working group including subject experts, method masters, and science educators were entrusted with the responsibility of developing the course on the basis of the nationally approved approach paper of the 10-year curriculum. In all stages of its work the working group consulted classroom teachers as well as teachers associations and necessary modifications were made on the basis of discussions.

The working group felt that inspite of the diversity of the country the basic and common problems of the rural area are - poverty, hunger, illiteracy, malnutrition, diseases, epidemics, drought, flood, famine, poor production of crops and exploitation. The integrated science curriculum must create proper motivation which together with the supply of material needs may help in solving at least some of the basic problems. It was also found out that the prevailing attitude of villagers and poorer sections of the society is that science and technology has nothing to do with their lives.

The working group also critically reviewed the materials developed by NCERT in earlier years. The observations were as follows: (i) the material is teacher-centred and its success depends upon the competence of the teacher; (ii) the course is loaded with contrived situations providing little chance for developing abilities and values in students and (iii) the course is designed for students who will pursue higher education.

Based on the foregoing observations, the working group recommended that integrated science should be designed to meet the needs of rural development. For this purpose, it was believed that the course must be fully integrated with the environment or the child. Instead of contrived situations, examples from the immediate environment may be used, making the course student-centred and socially relevant. Moreover, the concepts of science must be presented as a whole and not as amalgam of different disciplines. At this point, the basic problems of rural areas may be highlighted. Furthermore, the content and strategies of teaching the course should be within the competence of the teacher.

Finally, the working group formulated the general and specific objectives for the course. The development of objectives in the affective domain was emphasized.

B. Strategies used in translating the curriculum into teaching-learning instructional materials

In order to translate the core elements of the curriculum into the teaching-learning instructional materials, the working group determined the answers to the following questions: (i) for whom is this course intended? (ii) how much time will be required for this courses? (iii) what would be the nature of this integrated science course? (iv) what are the instructional materials to be developed? (v) what would be the sequencial arrangements of the topics? (vi) what would be the presentation of each topic in the textbook?

In presenting the content, the following aspects were considered: (i) observation of the child; (ii) inclusion of questions which the child asks about his/her observations; (iii) explanation of the phenomenon, so that the child may understand his/her observation; (iv) inclusion of activities which the child may do outside the school and (v) relevance of what the child has learnt from the chapter.

C. Training of teachers and other functionaries

The workshops were organized on a regional basis to orient the resource persons of the states. In those orientation programmes, together with aims and objectives, teaching strategies were explained chapterwise. It was stressed that teachers should be allowed to take full freedom in developing his lessons. In order to fulfil the philosophy of the curriculum and for getting the expected outcome, the teacher should be given the full liberty to replace the examples with these from his own environment. It was emphasized that teachers should consider their teaching successful, if: (i) the students become more interested in science; (ii) the students develop the habit of taking a decision after collecting and analyzing facts; and (iii) the students become courageous to ask questions on everything which they do not understand.

II. Development of the biology curriculum

A. Methods of identifying elements of the core curriculum

The course for the secondary level biology (last two years of compulsory science education) was designed by a working group composed of subject experts, method masters, science educators and classroom teachers to make pupils aware of the problems of the country related to the science of biology. Specifically, the course intends to relate the experience of the child about organization, maintenance and continuity of living organizations to agricultural practices, human biology, health and nutrition, and man and his environment.

The higher secondary biology courses are basic preparation to college education. However, for some students these courses may be terminal. Hence, it is important to prepare the child for certain socially useful productive work. The syllabus drawn by the working group

was circulated amongst the teachers, subject experts and science educators. Comments were collated and the syllabus was finalized in a workshop.

The existing textbooks for the secondary level were rewritten and rearranged according to the syllabus. One author wrote the manuscript of one unit for higher secondary biology. The manuscript was reviewed by a group of external reviewers and the working group. It was finally edited by the working group.

B. Strategies used in translating the curricula into teaching-learning materials

For this purpose, the working groups considered the following aspects: (i) nature of the target group; (ii) time requirement; (iii) course requirement; (iv) nature of the course; (v) kinds of instructional materials to be produced; (vi) sequential arrangements of the topics; and (vii) presentation of topics.

The concepts have been chosen in such a way that all the seven levels of biological organization - molecular, cellular, organ and tissue, individual, population, community and world, are equally emphasized. At the same time following basic themes of national development were covered - human environment, rural development, health, hygiene and nutrition, skill development, use and conservation of natural resources, international understanding and environmental pollution and control.

C. Training of teachers and other functionaries

Before introducing the course, the teachers were trained in summer institutes. The training was followed by programmes of monitoring the implementation.

D. Problems and issues in developing the instructional materials for integrated science and biology curriculum and strategies adopted for their solution

1. Ignorance of some functionaries about the new trend of science education and lack of proper appreciation of the goals of teaching science and its relationship with national goals, were identified as the most hindering factors in developing and implementing curriculum. This was further aggravated by the proprietary interest of the people trained in the different areas of science.

   The National Council of Educational Research and Training has organized and has plans to organize more seminars and group discussions on a regional basis on "New Trends in Science Education and its Relationship to National Goals". All the journals published by NCERT, specially the journal "School Science" is disseminating contemporary ideas of science education. Writing of articles in newspapers and magazines by the staff of NCERT have been encouraged.

2. Science education today is itself a discipline. It has its own methodology. Without following its methodology, it is not possible to evolve an effective science education curriculum. The shortage of time, "adhocism" in planning and negligence of the methodology of science education are the most important constraints.

   The group meetings, discussions and persuasions are in progress to eliminate these problems.

3. In the absence of any research studies about the concept of learning abilities of the child and the curriculum climate, the objectives and rationales were chosen in a subjective way.

   In order to overcome this deficiency, the NCERT has sponsored a number of research programmes, undertaken by its staff in the NIE Campus, in the Regional Colleges and in the other institutions of the country. Two research programmes undertaken by the members of the staff of the science department may be cited as example:

   a) Resources and problems - A number of concepts from the areas of air, water, soil, forest, using materials, using energy, human population, food and wild life, have been included in the courses of classes I-XII. The study was undertaken to identify the needs of the teachers and requirements of the schools for effective teaching of the concepts. A resource book will be developed on the basis of these findings.

   b) Use of living organisms - The new school syllabus demands use of living organisms in various activities. The project is aimed at developing a resource book on the basis of requirement survey.

4. The organization of schools and examination procedures have not changed to meet the requirements of the new curriculum. Existing time table, vacation, teacher-student ratio, arrangements of classroom and laboratories, procedures of school inspection and granting of funds, are seriously affecting the new curriculum.

   NCERT is organizing seminars for bringing change to the school organization. The meetings with State Government are going on to find out ways and means for bringing suitable changes. One important recommendation has been made to replace the single point entry system by multiple entry points. Extensive programmes of non-formal education and adult education have been undertaken to bring change.

5. Lack of interest amongst the teachers about new curriculum posed as a most important issue during the implementation of curriculum. This lack of interest is primarily because teachers were not involved in the curriculum and fear of students performance in the examination were also found to be very important factors.

The objectives of training programmes have been recasted. Different new programmes have been undertaken for training the teachers. The country has taken up the decision to establish a centre of continuing education in each district. These centres will be primarily responsible for helping the teachers in their work.

6. The absence of proper curriculum climate was found as one of the most important constraints. The ideas generated at the international and national level do not diffuse up to the level of the teachers and the community. This prevents effective participation of teachers and the community and thus create all the different problems.

   Strategies adopted to solve problem number 1 were also applied.

7. The service condition, salary, excessive teaching load of science teachers need further improvement.

   Efforts are in progress through discussion with teachers associations.

E. Mechanism and procedures for continuous evaluation

1. During training, the teachers were given a briefing on the manner to judge the expected outcomes;

2. A proforma questionnaire was given to the teachers to point out content errors, vocabulary difficulties, and suggestions for further improvements of each chapter;

3. In addition, steps were taken to review the textbooks examined by people who were not associated with its development, school visit by curriculum developers, discussion with students and teachers, discussion with supervisory staff; and

4. On the basis of the above findings the texts were modified.

Rep. of Korea

The Development of Educational Programme and Materials for Pre-Primary Education in Korea (by Dr. Sang Ho Kim)

The development of early education for younger children appears to be urgent in Korea. From the viewpoints of qualitative improvement of pre-primary education and the enlargement of educational opportunities for children, particularly in disadvantaged areas, many problems remain unsolved:

1. There are extremely limited opportunities for Korean children to benefit from pre-primary education;

2. There are few learning programmes applicable to younger children in pre-primary schools;

3. There are limited number of teachers who are competent and experienced in the field of early education; and

4. There is little recognition concerning the importance of parental involvement through home teaching for the facilitation of children's physical and mental development.

Recently, the Ministry of Education has become aware of the need to address itself to this area of education.

1. Kindergarten attendance will be raised from the present enrolment of 3.3 per cent to 70 per cent by 1991; and

2. Demonstration kindergarten classes will be established at sixty-nine schools by 1981.

The Ministry also realizes that there is a lengthy gestation period for a new educational policy and is anxious to commence work on development research on pre-primary education.

Pre-primary education project:

This project will be carried out by the Korean Institute for Research on the Behavioural Science with financial support from both the Ministry and the UNICEF in four phases during the period of 1978 to 1981 as follows:

1. First year (1978) - Completion of basic research, material development, and development of a teacher training programme;

2. Second year (1979) - Limited field trials, development of a parental programme, and revision of materials;

3. Third year (1980) - First dissemination stage and revision of the programmes; and

4. Fourth year (1981) - Comprehensive evaluation and preparation of recommendation pertaining to widespread diffusion.

A. Goals of the educational programme

The development of the educational programme is based on the condition that it is demonstrated to children in culturally and socio-economically disadvantaged communities. It is also anticipated that most of the teachers who are less qualified in terms of their teaching experiences and competencies will participate in our demonstration programme. Finally, it is clear that the cost involved in the wider dissemination of learning materials, particularly play equipment, is prohibitive at the present stage.

Relatively, in the open education of providing unsupervised liberty for children to enable them to indulge in generalized play, the success of the programme is dependent upon the skill of the teacher who

can relate the child's present level of functioning to successive and developmentally appropriate levels of mastery. However, under such conditiions as previously pointed out, it is inevitable to provide instructional materials systematically structured for the teachers so that these materials can be of assistance to them in the classroom. The instructional strategies call for the teacher to direct learning activities in which children participate. This participation is prescribed, but it is often encouraged that the participation occurs in a flexible manner to meet the needs of the children. In short, the degree of structure inherent in this programme may range from moderate to high.

The programme has set up general curriculum goals that are appropriate for younger children, both poor and advantaged. The goals are oriented toward the development of the whole child — cognitive development, affective development, language development, and physical development including health and safety.

B. <u>The process for translating the goals of the programme into the teaching-learning situation</u>

The process used in the development of the programmes for translating the goals into a series of learning experiences for children involves:

1. defining objectives, specifically stating what the child is expected to do following the instruction;

2. selecting and organizing contents referring to specific subject matters to be conveyed with certain materials, to use for particular learning experiences as related to specific objectives;

3. making table of specifications with a two-dimensional matrix, in which each objective is listed along one dimension and different content areas are specified along the other dimension;

4. writing the teacher's guide to instruction for each class activity;

5. making materials to be used for the classroom activities;

6. conducting field-trials to provide feedback data concerning the suitability of materials developed and the instructional strategies recommended to the teachers; and

7. revising materials on the basis of evaluation of the field-trials. The suitability of the materials is examined in terms of children's interest and the difficulty and feasibility.

C. Training of teachers for the programme

A teacher training programme to be developed will provide background knowledge and information concerning methodology appropriate to children aged 5 to 6. The most recent studies regarding child development will be utilized. The principles that underlie the instructional strategies suited to early childhood education will be elucidated. The optimum use of teaching-learning materials developed within the project will be demonstrated.

D. Problems encountered in the development of the programme

There was difficulty in matching the objectives of our programme to developmental levels of Korean children. The work on the selection of the objectives is done by our subjective judgement on the basis of literature reviews on developmental psychology. Up to now, empirical evidence for this purpose is very limited. The field trials to be conducted in 1979 will provide information necessary to solve this difficulty.

There was also difficulty in identifying latent factors as related to unsuccessful classroom management when it occurred. The researchers often adhered to formalized observation and assessment in the process of the validation study, and failed to find out hidden causes of unsuccessful management of the classroom. In some cases, human insight should be invited so that this problem can be avoided.

E. Mechanism of evaluation

During the period of the project implementation, evaluation will be conducted in two phases as follow:

1. Phase I (1978-1980) - internal evaluation to validate the programmes and materials developed; and

2. Phase II (1981) - external evaluation to provide broad - based data for preparation of recommendation pertaining to nationwide diffusion.

Nepal

Experiences in the Development of Curriculum Materials for Rural Development in Nepal (by Mr. Ayan Bahadur Shrestha).

Nepal is an agricultural country. Ninety-six per cent of the total population lives in villages. In this context, education must be geared to the rural needs.

Attempts have been made towards this direction. The National Education System Plan (1971-76) is the best example of this endeavour. Prevocational and vocational courses have been made compulsory at lower secondary and secondary school levels, respectively.

Development and use of instructional materials

The Institute of Education as well as other agencies have been involved in preparing teachers and para-educational personnel for rural development.

A. Methods to identify the core elements of the curriculum

Illiteracy, malnutrition, poor health, lack of vocational skills are considered to be the major problems of the rural community. So, the formal schools, besides general education courses, have incorporated pre-vocational and vocational courses in their core curriculum. The non-formal educational agencies taking care of the out-of-school youths and rural adults, emphasize on communication skills, nutrition, health and hygiene, and development of useful skills in their core curriculum. The teacher education curriculum for rural development incorporated courses on community development, home economics and techniques of using low cost materials in classroom teaching as the core elements.

The formal schools and teacher education institutes have, so far, adopted a more rational approach in identifying core curriculum elements for rural development. However, the agencies involved in non-formal education for rural development have used a more functional approach. These agencies conduct field studies and community surveys to identify the rural problems and needs, and thus determine the objectives and components of core curriculum.

B. Strategies and methodologies used in translating curriculum into teaching-learning materials

The Curriculum Development Centre has been established under the Ministry of Education with the responsibility of framing curriculum details of all the different school subjects. It provides guidelines for textbook writing and preparing other instructional materials.

The Educational Material Centre is responsible for preparing, producing and distributing the textbooks and other instructional materials for all the schools. This centre has so far used the contract system to write and prepare textbooks and other instructional materials. Manuscripts and samples of instructional materials are prepared by different persons or agencies, and the author or the agency whose sample material is selected is asked to sign the contract paper to prepare the material. The material so prepared is then evaluated by a committee of experts, and necessary changes or modifications are made. Then, the Education Material Centre produces the materials and distributes them.

The Institute of Education (IOE) and other agencies involved in teacher education for rural development have, however, adopted different methods of preparing and producing teaching-learning materials. They often involve their instructors/teacher educators to prepare instructional materials.

The Educational Material Centre has, so far, produced textbooks on all the subjects at different levels of schooling. The Institute of Education has produced learning materials on teaching language, science, mathematics, social studies and health for rural primary school teachers. The IOE has also been publishing 'Educational Quarterly' and

"Monthly News Bulletin" to disseminate the innovative approaches and research findings on education and teacher education.

The National Development Service Office has produced a series of pamphlets on various subjects of rural interest, and Centre of Educational Research and Innovation for Development (CERID) has produced booklets on using low cost materials in teaching rural children. The Integrated Hill Development Project has prepared notice boards to be placed at different strategic positions in the village to motivate rural people to learn. It also publishes monthly news bulletin called "SAGHAN PAILA" which contains mostly news and topics of rural interest.

C. Training of teachers and other personnel

The Institute of Education (IOE) is responsible for preparing teachers and other personnel for the effective implementation of curriculum and use of instructional materials. The IOE has established thirteen different regular campuses and ten extension centres at different regions to meet this purpose. The different campuses run pre-service as well as in-service teacher training programmes.

The IOE organizes short-term teacher training programmes to upgrade and to update the in-service teachers. Besides, it also organizes workshops and seminars of school headmasters and supervisors on school management and instructional supervision. Often such seminars and workshops are organized regionally and with the collaboration of the Ministry of Education.

The periodic workshops and seminars of the school headmasters and supervisors have, so far, been the main mechanism of evaluating the effectiveness of teacher training programmes. The general reaction of school headmasters and supervisors to the present teacher training programmes was recently found to be that the teachers who have gone through long term training in the institute are quite effective in using teaching aids and other instructional materials. However, they are said to be weak in content area. Adjustments in the regular teacher education curriculum has recently been made.

Lack of qualified teacher educators has been a problem for implementing in-service as well as pre-service teacher training programmes. So, Degree in Education (M.Ed.) programme must be instituted in some teacher education campuses.

D. Problems and issues in the development and use of instructional materials

Teaching-learning materials could not yet be produced in adequate number, and some of the materials so far produced are not so satisfactory. Some of the major problems encountered in this connexion are as follows:

1. The national policy for rural development has not yet been fully reflected in curriculum designing and implementation. The formal schools and colleges have resisted to open their doors to rural community needs.

To resolve this problem the present non-formal education programmes must be more expanded and strengthened. The community leaders and school teachers should be utilized in the development and implementation of the non-formal education programmes. Some of the agencies involved in rural development programmes have already started utilizing school teachers and school facilities in educating rural people.

2. Inadequate training and lack of exposure to rural situation and community needs on the part of the writers and others have persisted to be another problem in the preparation of educational materials for rural development. But the strategy recently adopted by the Institute of Education to depute some potential writers to rural teacher training centres for a certain period of time, and get them involved in the preparation of instructional materials after their return is likely to solve this problem to a great extent.

   Another strategy that could be adopted in this connexion would be to provide expertise and guidance to the rural teachers to prepare instructional materials for rural school use.

3. Inadequate funding is considered to be another hindrance. But as attempts are being made to produce low cost materials, it should help resolve this problem to a large extent.

   Sometimes, a question is raised as to whether private sectors should be involved in preparing textbooks and other instructional materials for rural development. But it looks futile. For, in the present situation no private agency would be interested in producing such materials, because there is very low possibility of getting a good market for selling these materials.

E. Mechanism of evaluation

The Ministry of Education has developed a mechanism of periodic evaluation of the textbooks and other instructional materials. It appoints periodically a team of teachers, subject and curriculum experts to visit a certain number of schools and find out the experiences of the school children, classroom teachers and school headmasters with the use of the instructional materials provided to them. This team often uses questionnaires to get adequate information for evaluation. But they do supplement this information with on-the-spot observations. Necessary changes and modifications in the instructional materials are brought about on the basis of the recommendation of this evaluation team. Such an evaluation work has been done by the Ministry of Education quite recently.

Feedback information, official or non-official, from school teachers, supervisors and others have often played part in the evaluation o school curriculum and the use of instructional materials. Besides, some research centres such as NEW ERA have been involved in designing and conducting research projects in connexion with the utilization of school instructional materials.

Pakistan

Experiences in Developing Curriculum Materials for Primary and Secondary Schools (by Mr. Mahmudur Rahman)

A. Methods to identify the elements of the core curriculum

A new Education Policy was formulated in 1972 according to which a comprehensive change in the curriculum was fully recognized. The policy had emphasized the design of the curriculum relevant to the changing socio-economic needs with a massive shift from general education to a more purposeful agro-technical education. For the achievement of this purpose, the policy has encouraged the inclusion of vocational courses as well as practical work in the primary and secondary schools.

Keeping in view the modern approach to curriculum development for vocational education and in order to make this education purposeful, it was decided to make it related to three distinct settings: Personal Life, Family Life and Community Life. The following broad objectives were expected to be achieved:

1. Students will be in a position to make useful contribution to home, school and community life;

2. Sense of dignity of labour will be achieved in the students;

3. Aptitude, interest and ability of the students to the particular fields will be developed;

4. The proficiency in the use of elementary hand tools and equipment will be developed; and

5. The children who cannot pursue higher education shall be able to become better farmers and craftsmen.

The Education Policy also considered that the new curricula will not be implemented effectively unless the entire school system has facilities in terms of necessary minimum equipment and trained army of qualified teachers. Hence, the policy emphasized the improvement of teaching methods and provision of instructional materials and teaching aids to elementary schools.

B. Strategies used to implement the new curricula

The Curriculum Wing decided to develop comprehensive projects on teaching kits known as the National Teaching Kit. This scheme envisages provision of teaching kits consisting of instructional materials covering a wide range of school subjects. The teaching kit also includes a teachers' manual for guidance of the teachers. The manual consists of investigations children may make, instructional materials needed for such investigations, approaches to conduct investigations/activities, suggestions for teachers, and further suggested activities for bright students.

The new curricula have been developed in Pakistan. Teachers' guides have been produced for the new approach. In order to train the teachers for the new curricula, in-service teachers' training courses have been started by Allama Igbal Open University. The instructions are imparted through sending the materials by correspondence. On qualifying after taking the course, the teachers are awarded certificates, and as incentive, they are given advanced increments.

Teachers' guide have been developed for use of the primary teaching kits. Provincial Textbook Boards are responsible for writing and publishing the textbooks from primary to higher secondary levels. The special feature of these books is that they may be produced according to a uniform curriculum and at the same time be low-cost.

Moreover, the Pakistan Government realized the necessity of an organization which may tackle the day-to-day problem of the production of textbooks for school, college and university students as well as supplementary reading materials for the young generation in Urdu language. For this, the National Book Foundation (NBF) was established in 1972 under the control of Federal Education Ministry, having a Board of Governors headed by the Federal Education Minister. The NBF has published more than 500 books on medical, engineering, commerce, law and economics subjects. It has the following departments:

1. Editorial Board:

   a) Panel of subject experts;
   b) Competent editors;

2. Illustration Wing: Composed of well-established artists; and

3. Production Wing: Having competent proof-readers printing experts, paper experts, etc.

The NBF has contributed supplementary reading materials in the national language covering five age-groups: infants and children 3 to 6 years, 6 to 9, 9 to 12, and 13 to 14. The topics covered are history, geography, unusual birds, plant life, science, Urdu classes, think and play stories, novels and poetry. From 73 titles published by the Foundation, 21 titles are on science and related subjects.

Aside from supplementary reading materials, the NBF has been entrusted with the task of publishing textbooks and teachers' books for all the provinces.

C. Training of teachers to use the instructional materials

In order to implement the curricula, the teacher education programme, both at pre-service and in-service levels, have been reorganized.

The Curriculum Wing invited experts from all over the country to train the key educational personnel in the use and maintenance of teaching kits during a workshop for in-service training of teachers.

D. **Problems encountered in the development of the instructional materials and strategies to solve the problems**

1. Non-availability of such printing presses that could publish textbooks at low cost and without delay as they remain busy in printing other types of materials. The government should give instructions to all presses to give priority to textbook printing at nominal charges.

2. Type-face of different sizes and categories are not used in textbooks, keeping in view the age and grade of children. The Curriculum Wing may give instruction in this respect.

3. Materials, like paper are imported from abroad. White printing papers become costly resulting in the high cost of printing. The government should adopt policy lifting the duty on white paper imported for printing of textbooks and reading materials.

4. Design and lay-out have not been given due attention while preparing textbooks.

5. Bold type has never been used for headlines and sub-headlines.

6. Illustrations sometimes appeared to be irrelevant to the text.

The NBF has solved the problems Nos. 4, 5, 6 by modifying the mechanics of printing.

7. Coloured illustrations are seldom used in textbooks. Although NBF has paid attention to this issue, a concrete step should be taken to make the textbooks and reading materials more colourful to arouse children's interest.

8. Binding and cover paper are inferior so that books cannot withstand the handling of the child. This defect can be removed only through importation of ivory card free of duty and improvement of book binding methods.

E. Mechanism and procedures for continuous evaluation

The NBF which has been entrusted with the duty of publishing textbooks and supplementary reading materials has a panel of subject experts belonging to schools, colleges, universities and literacy societies. The manuscripts are given to them for evaluation and comments. If they need some amendments in the text, then the authors are advised to rewrite the manuscripts in the light of the given suggestions, otherwise the manuscripts are passed on to the Editorial Board which edits comprehensively, removing all types of mistakes and also checks facts and figures. Thereafter, the manuscripts are sent to the Illustration Wing which is required to go through the texts for checking illustrations and making the design, lay-out and covers for the books. Afterwards, the manuscripts, along with the relevant illustrations (black and white, and colour) are passed on to the Production Wing which is responsible for selecting the appropriate type of paper, type, ivory card, etc., and for proof-reading. When the books are

ready for sale, complimentary copies are sent to all leading newspapers, journals, radio and television centres for comments. Any suggestions given in the reviews are implemented in future editions.

Democratic Socialist Republic of Sri Lanka

The Development of Instructional Materials for an Integrated Teacher Education Programme in Rural Communities. (by Mr. S.B. Ikanayake)

The content and structure of the education system in all parts of the country did not reflect the aspiration and needs of the community because of the subservient system of education adopted by the colonial masters. Hence, there was a need to develop a new system of education. The 1972 Educational Reforms in Sri Lanka tried to meet these new challenges by relating education to societal needs. This resulted in changes in the school curriculum. The needed changes in the teacher training programme relating the curriculum to rural development followed. These were based on the Hingurakgoda Pilot Project which commenced in 1975.

The two broad objectives of the project were as follows:

1. To train teachers to understand the realities of the community, not in isolation but in participation; and

2. To introduce the concept of developmental education and self-reliance as a part of the teacher education programme.

A. Methods to identify the common and special elements in the core curriculum for teacher education programme

On the basis of the above objectives, a method of identifying teacher competencies for developing a teacher education curriculum was attempted. A series of surveys was conducted by teachers' colleges to identify the common problems of the rural school. The findings were categorized under the following heads:

1. Teachers

   a) Inability of the teacher to comprehend the nature of socio-economic and cultural structure of the village;

   b) The problem of translating into action and reality, the theoretical educational knowledge, and sophisticated teaching techniques; and

   c) Lack of an understanding of the problems of the village.

2. Administrators

   a) Applying the same rules and regulations meant for the affluent and urban school for the rural school as well;

   b) Lack of incentives/rewards for the teacher; and

   c) Poverty of the parents not taken into consideration in providing facilities.

3. Curriculum Developers

a) Use of the same curriculum meant for the affluent school in the rural areas; and

b) Resource and needs aspects ignored.

Based on these, the following domains were determined to be major areas of the teacher training programme for rural development:

1. Development of productive skills based on local resources and needs;

2. Knowledge and use of appropriate technology, using traditional technologies as basis;

3. Ability to develop methods to foster health and nutritional habits at the village level;

4. Adoption of relevant methods to improve literacy and numeracy at village level;

5. Ability to develop programmes which do not disturb the cultural bonds of the villagers;

6. Development of skills to suit resources and needs;

7. Development of skills in self-learning habits;

8. Development of leadership roles including the ability of identifying leaders at the village level;

9. Ability to integrate developmental activities; and

10. Ability to use resources for learning activities at school.

In drawing up of the curriculum, consideration has to be given to relevant political, social and economic changes of the society.

B. Strategies and institutional arrangemets used in the development of the teacher training programme

For teacher educators, administrators, teachers, principals:

1. In 1976 and 1977 two national seminars on teacher training for community development were conducted. A multi-disciplinary approach was attempted at these seminars. These seminars were for teacher educators and regional administrators. The objective of the seminars was to develop teachers to become "link personnel" at the village level for an integrated development programme;

2. Special curriculum for a one-and-a-half month course on community development was developed for principals of schools, who have already undergone a pedagogical training.

3. From 1977 community development was introduced as part of the professional component of the teacher training curriculum.

4. Community development was included as part of the teaching practice component in teachers' colleges. A programme where the community was brought into the teachers colleges to use its resources was adopted.

5. Short-term in-service courses for a duration of five days was usually conducted in remote villages. The participants were principals of small schools. Evaluation of this programme was done at a teachers college after a period of three weeks. The participants comprised resource personnel from other departments and villagers.

In all these activities, the community participation takes the following forms:

1. Village organizations take an active part in assisting teachers in programming for their village;

2. In some workshops, they act as resource personnel and co-participants.

Teachers are provided with progress charts to plot the progress of the programmes.

C. Training of teachers and other personnel

1. In-service courses for those who are already trained;

2. Evaluation of projects undertaken by the teachers;

3. Survey of villages to collect data on:

   a) resources of the village;
   b) cultural pattern;
   c) health and nutrition;
   d) mass media; and
   e) educational problems.

D. Problems and issued encountered in the development of the materials and training

1. Time factor of the course, hence, inability to go deep into the crux of the problem;

2. Difficulties in keeping the same teacher educator in charge of the same group due to transfers;

3. Finding funds;

4. Transport problems;

5. Problems arising out of vested interests;

6. Legacy of miseducation, i.e. learning for examinations and not for preparation to life as citizens of a country;

7. Problem of getting other departments to act quickly and regularly;

8. Unhealthy relations between school and community;

9. Loss of confidence in government and voluntary organizations;

10. Delay in achieving targets due to ambitiousness of the project planners; and

11. Lack of incentives for the teacher.

Strategies used to solve these problems:

1. Extension of the course duration from two years to three years from 1979;

2. Training a large number of teacher educators;

3. Publicity given to the innovative programme;

4. Using more and more of other departmental personnel to propagate the idea of integration;

5. Targeting for small-scale projects; and

6. Awarding of merit certificates for participating teachers to recognize them in promotions.

E. Mechanism and procedure for continuous evaluation

1. Teacher educators visit the projects during and after the programmes;

2. Teachers of the village are in touch with the teachers' college;

3. Principal of the village school makes constant and regular evaluation;

4. The group leaders of the teacher trainees make constant visits to the project villages;

5. Officials from other departments also make regular visits to see the progress;

6. Use of progress charts by the principal of the school. They are sent up to the teachers college fortnightly; and

7. Confidential report of the principal of the school sent to the teachers' college.

Thailand

Experiences in Developing Curriculum Materials for Science Teacher Education in Khon Kaen University (by Dr. Kingfa Sintoovongse)

Khon Kaen University has been serving as a centre for training teachers in science and mathematics for secondary schools in the northeast region of Thailand since 1969. The major objective of the science/mathematics teacher education programme is to train teachers to be capable of teaching science and mathematics at both lower and upper secondary school levels. The curriculum for science and mathematics teacher education was revised and has been put into practice since 1976. The revision was done in order to meet the new science and mathematics secondary school curricula introduced by the Institute for the Promotion of Teaching Science and Technology (IPST).

A. Common and special elements of the curriculum

There are four fields of studies commonly found in the B.Ed. degree programme at the undergraduate level of the university in Thailand: (i) general education; (ii) field of specialization; (iii) professional education; and (iv) free electives. Due to the demands for science/mathematics teachers in the northeast region, Khon Kaen University specifically attempts to produce science and mathematics teachers who can teach at both lower and upper secondary school levels. The courses offered in the area of specialization include two levels of science and mathematics. The students have to take courses in general science and mathematics (38 credits), so called "Level I", before taking more courses in "Level II" which are in-depth studies in science and mathematics (30 credits). The students may choose to major in physics-mathematics, biology-chemistry, biology-mathematics, or chemistry-physics, etc. This scheme of choosing a major subject enables students to teach two subjects related to those they have studied.

B. Strategies in developing the curriculum materials

Students are also required to take courses in the field of professional education which partly are instructional methodology courses. The principal objectives of these courses are: (i) to provide students with content of science and mathematics lessons existing in secondary school textbooks; (ii) to develop students' ability in specifying behavioural objectives; (iii) to train students to be able to implement specific methods of teaching in science and mathematics; and (iv) to familiarize students with the use of summative and formative evaluation techniques.

In order to know if the student-teacher can really implement what they have studied in those instructional methodology courses, a questionnaire has been designed and a systematic observation technique used to get the feedback. The information from the evaluation shows that approximately 60 per cent of the student-teachers need more to learn about inquiry and also questioning techniques. The data from observation indicate that most of the student-teachers still use the traditional way

of teaching, i.e., lecturing. In addition, from the research findings, it has been found that students' performances on 7 Piaget's logical operations were not effected by different curricula in science.* Another study on the synthesis of 239 pièces of research** also shows that a teacher is still the centre of a classroom although a variety of new methods in teaching has been introduced. The implication of the aforesaid findings indicates that teachers need to be trained more in specific teaching techniques that ought to be used in a particular subject matter. In science, inquiry is specifically emphasized as a way of teaching.

C. Training of personnel in designing and improvement of the materials

The model of teaching science as an inquiry was developed as a self-instructional unit. This unit is composed of:(i) supplementary reading; (ii) teachers' guide; and (iii) exercise sheet. In the supplementary reading, the definition of inquiry is operationally specified. The student will gain the concept of inquiry by self-study. The teachers' guide is essential to the student because it shows how inquiry can be developed logically. After studying the teachers' guide, an exercise sheet is provided for each student to work on.

The inquiry unit was actually brought up to the classroom in some of the instructional methodology courses. First each student studied by himself and then gathered in a group of five or six people to discuss about inquiry. The teacher acted as an advisor. If students had any difficulties, they could ask for advice. Units of inquiry with different contents were designed and returned to the teacher with comments. It was envisioned that these units of enquiry would be used during the teaching practice.

D. Problems and issues encountered in the development of the materials

The development of science and mathematics materials was initiated by the State University workshop aiming at developing curricula and instructional materials in science and mathematics education. The materials have been revised and put into practice so as to serve the demands of the students. Up to now, it is not yet known whether the students have learned the concept of inquiry. In the near future, there is a plan to follow up the results. However, the decision regarding the process of evaluation has not yet been made. This try-out has just been started in a small way. Hopefully, it will bring about some advantages to the practice of teaching science for the prospective teachers.

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* Sintoovongse, et. al. "Student's Ability in Using 7 Piaget's Logical Operations to Solve Learning Problems". Undocumented research paper presented at SEAMEO-RECSAM, Penang, Malaysia, April-May 1978.

** Suwannathat, Chancha. A Synthesis of 239 Research Papers. Institute of Behavioural Science Research, Prasanmitra, Bangkok, Thailand 1978.

E. Procedures for continuous evaluation

As stated before, this set of materials has just been utilized to incorporate inquiry approach to science teaching. The implementation is in an early stage. Evaluation of theoretical learning shows that most of the students seem to comprehend the concept of inquiry, but results of practicum evaluation has not been completely analyzed. One technique of evaluation used now is by observing students' presentation of their teaching lessons in the classroom and whether or not they are able to utilize inquiry while teaching. The report of this type of evaluation will be ready after the course in the teaching of lower secondary school is over.

Group C. Other Materials (printed or non-printed materials, including modules, self-learning tools, etc.)

Indonesia

The Development of Science Instructional Materials for the Development School Project in Indonesia (by Mrs. Rata Wilis Dahar)

Since 1974, science instructional materials for the Development School Project in Indonesia have been developed in modular system. A team for curriculum development consisting of subject matter specialists and subject matter teachers was assigned to develop curriculum for science education and science instructional materials. Science instructional materials are developed after the curricular objectives, the organization and the time allocation for science education from grade I to II have been decided. The curricular objectives of science education programme have been derived from certain problems and needs as they are found in the physical, cultural and socio-economic environment.

A. Methods to identify the elements of the science curricula

A team of officals of the Ministry of Education, experienced school principals and school supervisors, teachers and curriculum planners for science subjects, was assigned to study the educational objectives in the Basic State Policy, the report of the national assessment of national needs and problems, and report of the study on the quality and placement of students after a certain school level.

The elements of the science programme for the elementary and the junior high schools are organized to include three areas, namely, living things, matter and energy, earth and space science. The topics in science are developed from the simple to the more complex concepts. Horizontal integration across topics is established by using science processes as the common element.

For senior high school, the programme is organized as follows: At the first year where science is compulsory for all students, the programme is offered as general science courses, while at the last two grades of senior high school, the following subjects are offered (physics, biology, chemistry, and space and earth science).

B. Strategies to develop the science curriculum materials

A team of 15 science educators (subject matter specialists and selected experienced competent teachers) and three consultants developed science instructional materials in a modular form. These include:

1. teachers' manual;
2. student activity booklet;
3. student worksheet;
4. answer sheet for student worksheet items;
5. student assessment sheet; and
6. answer key and working scheme for less items.

The major steps in developing modules are:

1. Working group discussion to analyse and classify topics into units of modules;
2. Allocation of time of each unit of module;
3. Group discussion on new approaches and methods of science teaching, learning theories, varieties of experimental approaches, and evaluation techniques; and
4. Individual writing which includes the following steps:
   a) identifying the prerequisite for learning certain unit/module;
   b) designing instructional objectives and test instrument;
   c) developing student activity programme in order to understand how students learn, how to develop a certain concept, and how to select appropriate methods and approaches;
   d) developing the worksheet;
   e) developing the teachers' manual;
   f) devising the key to the worksheet and the test;
   g) developing enrichment and remedial programme; and
   h) identifying science equipment needed.

C. Training of teachers for use of science instructional materials

A special in-service training programme regarding the teaching-learning process of modular instruction is provided for the teachers. Strategies for more intensive in-service teacher training programme are planned.

D. Problems and issues

Some problems and issues encountered in the development and use of the modules are:

1. The development of module with good quality;
2. The development of positive attitudes of teachers and students toward using the modules;
3. The difficulty to estimate the proper time needed to accomplish learning a module; and
4. The development of instruments to assess students' attitudes and students' capability to conduct science activities individually.

E. Mechanism of evaluation

A national team collects the reports and feedback from the different parts of the country. These reports are sent to individual writers of each module. The writers also accept direct comments from teachers and collect their own observations from the classroom.

Indonesia

Developing Instructional Materials for Primary and Secondary Schools (by Mr. Sudijarto)

Since 1973, Indonesia has adopted a systematic model of curriculum development that places the development of instructional materials as the last stage of a consecutive series of curriculum development activities. These consecutive series of curriculum development activities are:

1. The formulation of institutional objectives;
2. The planning of the structure of school learning programme;
3. The formulation of curricular objectives;
4. The selection and organization of the content of each subject area;
5. The selection and determination of teaching-learning strategy; and
6. The development of instructional materials and media.

The formulation of educational objectives

This is an important step to be done before developing the school curriculum. To do this job, a team of officials of the Ministry of Education composed of experienced school principals and school supervisors, teachers, and curriculum planners, is assigned to study the following documents:

1. National educational objectives stated in the Basic State Policy;
2. Educational objectives derived from a national assessment of national needs and problems; and
3. Other relevant documents indicating the expectation of the society regarding the quality of people graduating from a certain school level.

The criteria to be used in formulating the educational objectives at this level are:

1. To be consistent with the spirit of the state philosophy as stated in the Constitution;

2. To be relevant to the social and national needs;

3. To be relevant to the age level of the children; and

4. To be realistically attainable within the time allocated.

Planning the structure of the school learning programmes

At this step, the function and the roles of each subject area is determined in the framework of the total school learning programme. Thus at this stage also, the time required for a certain subject area is allocated based on its value or contribution to the achievement of the objectives of the school programme.

A. Methods to identify the core elements of the curriculum

A committee in curriculum for each subject area consisting of selected experienced teachers in a particular subject matter and experts in curriculum design is appointed to identify and formulate educational objectives to be achieved by a certain subject area offered in a certain school. This level of objective is known as curricular objective. In carrying out this assignment, the committee undertakes the following activities:

1. Identify all possible knowledge, skills and attitudes to be mastered by students through learning certain subject areas; and

2. Select from the identified objectives those which are considered the most essential for a certain school level and attainable within the span of time allocated for the subject.

The same committee that formulates curricular objectives continues working to select the content that will support the achievement of the objectives. Since the formulation of curricular objectives is still too general to be used as an instrument to select content, an intermediate step is suggested to be taken before directly selecting the content. This intermediate step is identified as the step to translate curriclar objectives into more specific objectives known as general instructional objectives. After this intermediate step is finished, the committee then starts identifying the most relevant and effective content/topics by conducting the following activities:

1. Identify the concepts, theories, facts, systems and problems deriving from a certain subject area that must be learned by the students; and

2. Using the instructional objectives, select those topics identified on the basis of the following six criteria:

   a) the topic should be one of the most effective learning activities to achieve the stated instructional objectives;

   b) the topic should be relevant to the socio-technological environment of the school;

   c) the topic should be up-to-date in relation to the stage of development of science and technology in the society where the school is operating;

   d) the topic should be relevant to the interest of the students; and

   e) the topic should be appropriate to the maturity level of the students.

While the committee was identifying and selecting topics, sequencing the content logically and effectively has not yet become the issue, and should be done afterwards. The following criteria are suggested to be used in organizing the content:

1. Continuity in the sense that it should be sequenced vertically;

2. Progressively logical in their sequence; and

3. Integration in the sense of having horizontal relationship with other relevant subjects.

B. Strategies in developing instructional materials

There are two types of instructional materials developed in Indonesia, namely; textbooks and modular learning programmes.

1. Textbook writing: A team of subject matter specialists, selected experiences teachers and university professors is assigned to write textbooks. This team consists of two main groups, the writers and the evaluators. In carrying out its assignment, the team conducts the following activities:

   a) Designing the outline of the textbook by the whole team;

   b) Writing of the first draft of the manuscript by individual writers;

   c) Reviewing of the first draft by the whole team;

d) Revising and rewriting of the reviewed draft;

e) Trying out the revised manuscript;

f) Revising the manuscript; and

g) Publishing the text (teachers' guide and student text).

2. Developing instructional materials in modular form: In translating curriculum elements into instructional materials in modular form, a group of subject matter specialists, selected experienced teachers, and professors of subject matter is assigned. In carrying out this assignment, three major stages of work are followed: (i) the stage of designing the blueprint of the module; (ii) the stage of the write-up of the module; and (iii) the trial stage.

Designing the blueprint of the module: There are eight steps to be followed: (i) analyse the basic course outline of each semester or quarter; (ii) group topics into a well-sequenced unit; (iii) allocate the time for each unti; (iv) generate specific instructional objectives for each unit; (v) develop test instruments to measure the achievement of the specific instructional objectives; (vi) translate the identified unit into a more clarified description of lessons to be learned; (vii) identify types of learning processes to achieve the objectives; and (viii) identify instructional aids needed to facilitate the learning process.

The writing stage: Each writer is assigned to develop the blueprint into self-learning instructional programme, as the first draft to be reviewed by the group.

The trial stage: An approved module is then put into trial for getting feedback on the effectiveness and efficiency of the individual module as a teaching-learning device. The results of the structured as well as unstructured feedback are to be used for revising the module. Structured feedback are those that are collected through prepared instruments, tests, and structured observations designed by special evaluation team, while unstructured feedback are those collected based on teachers' comments and writers' direct observation.

C. Training of teachers and other personnel in the design and use of instructional materials

The designers were mostly selected from those involved in the process of selecting and developing modules as the teaching-learning device. They were then sent abroad to have intensive training for at least three months. This core group then trained the other writers in a series of national training workshops.

A training package in modular form was developed to train teachers on how to operate the classroom in using the modular system.

D. Problems and issues

1. The development of relevant curriculum;

2. The approach to be used in curriculum development; and

3. The level of professional competence on the part of teachers in translating curriculum suitable to the local environment.

E. Mechanism of evaluation

The evaluation of the instructional materials is done at the national level. It is identical to the evaluation procedures employed in the science instructional materials.

Iran

Science Curriculum Development and Research Experiences at Bu-Ali Sina University in Iran (by Dr. Masood Sadral-Ashrafi)

An elementary integrated science curriculum called "General Science" is being developed in the Science Education Centre (SEC) at Bu-Ali Sina University (BASU). The development is undergoing its early stages. After the completion of the first set of materials and equipment, it is hoped that the Iranian Ministry of Education will allow its implementation on a trial basis in the schools located in the Humadan province. General science will be designed for all elementary grades, i.e. grade 1 through 5 in the Iranian new educational system of 5 + 3 + 8.

It is the belief at the Bu-Ali Sina University Science Education Centre (BASUSEC) that the design and development of a science curriculum should have sound research basis. That is, the curriculum writer should employ the latest research findings in the area of science education as well as design and carry out specific experimental studies directly relevant to science learning in the area (or areas) of intended implementation. Several research projects have been carried out and a few others are currently under progress. Two of these projects are the study of object literacy, and the use of film text for scientific literacy.

A. Methods to identify the elements of the core curriculum for general science

The core elements of elementary science materials have been identified in a way which is congruent to the philosophy of BASU. The materials are intended to be innovative, integrated, and problem-oriented.

Here, innovation refers to either the inclusion of a new idea into the materials development or a new application of an already existing idea. Integration of science subjects will be done in such a way that science learning will occur around some general concepts. Six scientific concepts have already been identified: (i) science and scientific methods; (ii) time, space and motion; (iii) entropy and

information systems; (iv) matter and change; (v) conservation; and (vi) energy. This list of science concepts is neither exhaustive nor exclusive. Concepts may be added, subtracted or changed. Problem orientation refers to general science problems as well as some specific problems found in the community. Construction and use of materials will be done in relation to these problems.

B. Strategies used in translating core elements into teaching-learning materials

In translating the core elements into teaching-learning materials, special attention needs to be paid to the main criteria of the curriculum (innovation, integration and problem orientation). For example, in writing a module on the concept of energy, how this concept is viewed or utilized in physics, chemistry or biology will be discussed and relevant examples will be given from each area. These examples will be mostly taken from the environment around the community which are related to a problem (or problems) already of concern in the community or related to questions about natural phenomena.

C. Training of teachers in the use of the instructional materials

All science teacher training at BASU are of in-service form which will minimize the problem of acquainting teachers with the materials. Teachers usually come from the province of Hamadan and the surrounding areas and are obliged to return to the same general area. It is also noteworthy that the teacher training programme already underway at BASU is tuned towards integrated science curricula which further prepare teachers for teaching general science courses once completed.

D. Problems and issue encountered in the development of the materials

The main problem of concern is how to make arrangements for trying out this curriculum on a temporary basis in Hamadan province. Some contacts have already been made with the officials of the Textbook Writing Department of the Ministry and continued communication with the Ministry of Education will be pursued during the development Process. A second anticipated problem concerns the lack of research regarding the community and especially on how children learn from written visual and tactile materials. To solve this problem, existing research findings should be reviewed and experimental studies should be reviewed and carried out in the community.

E. Mechanism of evaluation

Evaluation of the materials will include on-going evaluation and monitoring of the development process and an overall evaluation at the completion of the materials. The on-going evaluation will be based on pilot studies, short-term evaluations, interviews with teachers and students. These evaluation data will be treated statistically. The overall evaluation, however, will utilize an evaluation model called "evaluation by jury". In this process, all interested parties (such as curriculum writers, teachers who will use the materials, students, parents, etc.) will prepare "cases" for or against the curriculum. In preparing a "case", the individual can utilize any kind of data he feels appropriate.

A jury of unbiased experts who have no vested interest in the curriculum will then hear all the cases and call whatever witnesses they think necessary. The jury will be responsible for making the final decision to adopt, not to adopt, change, review or rewrite the materials.

Rep. of Korea

Using Critical Incidents Techniques for the Identification of Teacher Competency in the Development of Teacher Education Module (by Dr. Hong Kyoo Byun)

Since the competency-based teacher training programme was first initiated at Jeonbug National University in 1974, there had been some problems even though the programme had many innovative advantages and effectivenesses. One of the most crucial problems perceived was the inadequacy of the teachers' knowledge and skills in generating competencies themselves so that students could learn more effectively.

The objectives of the programme are to train the teachers: (a) to interpret or translate critical incidents objectively and precisely into observable behaviour; (b) to identify, analyse and generalize specific competencies needed by teachers and students; (c) to identify a level of proficiency of teachers and students in the generalized competencies; (d) to organize the generalized competencies into units and then into modules; and (e) to evaluate student outcomes or behaviours in reference to prescribed criteria, the competencies.

A. Methods to identify the elements of the training programme

There are several ways to define operationally the teacher competencies in a given subject area. In this particular study, the Critical Incident Technique was used. It is a technique to identify observable human activities from the significant, concrete and unforgettable incidents teachers met in their teaching career. An incident is an observable human activity which is sufficiently complete in itself to permit inferences and predictions to be made about one who is performing the act, but to be 'critical', this incident must occur in a situation that is clear to the observer and definite in its consequences.

B. Strategies used in designing the teacher training programme

The training programme of competency determination from critical incidents uses mainly questionnaire forms. The first two steps were used to determine competency through the selection and translation of critical incidents gathered from all participants and synthesizing them into specific statements of competency. The final decision is made through a panel discussion among participants and professors of the college. The remaining two steps are for competency evaluation and for construction of instructional modules.

C. Training of teachers in the designing of competency-based teacher education programme

Since the adoption of this progtamme in 1977 at the Jeonbug National University, 875 teachers have been trained. They usually participated in one or two types of programmes, namely, in-service education

for advanced level of certification, and for self-renewal education. The choice is arranged by the Provincial Board of Education under its in-service teacher education schedule for the year.

From the reports on teacher competencies made by several different groups of teachers, the University has made a preliminary set of major categories and sub-categories based on around 55 competencies identified so far. The major categories were as follows:

1. Diagnosis and evaluation:
   a) diagnostic skills
   b) evaluation skills

2. Professional technique:
   a) knowledge skills
   b) preparation skills
   c) behavioural intervention skills
   d) instructional skills

3. Inter-personal relationship:
   a) personality factors
   b) communication skills

4. Administrative skills

The teachers were asked to make and try out their instructional module based on these skills and to bring the problems to the next session.

D. Problems encountered in using the programme

There are reasons why all professors do not use this approach. One crucial reason is that the college professors are lacking in the understanding of this way of competency-based teacher training. The process of data collection and their analysis present some problems. Another problem is pointed out also in the process of generalization of competencies from critical incidents.

E. Mechanism of evaluation

The first step in evaluation is actually done under the schedule of national and provincial assessment of student achievements with reference to expected criterion. But for the programme itself, the questionnaire and case demonstration methods are usually applied.

It was reported that this training method displays several innovative features in comparison with other traditional methods. One finding is that this programme stimulates the growth of professional attitude and belief in teachers who have participated in the programme. It is also recognized that this programme can contribute to the increase of curriculum integration more than any other. This programme also affords rethinking of certification standards and procedures in in-service education programmes and of advanced levels of certification.

Rep. of Korea

Curriculum for Rural Development: Instructional Materials for the Saemaul Movement in Republic of Korea (by Dr. Tai Bom Chung)

Modernization in Korea took place in two aspects; (a) to form the new society through industrialization and (b) to develop a new community through the Saemaul Movement. The Saemaul Movement for rural development has been strongly supported by the government at both central and local levels.

One of the charactiristics of the Saemaul Movement is comprehensiveness of its programme in which education is a part. The schools in Korea have been taking active part in this movement since 1971.

The Saemaul Education Project at schools has been carried out under the direction of the Ministry of Education. The objectives of the Saemaul Education are:

1. To inculcate among the students the attitudes and behaviour required for the realization of Saemaul ideas of diligence, self-helped, and co-operation;

2. To develop the democratic impetus through self-learning as well as mutual learning procedures;

3. To develop the basic knowledge and skills required for rural development;

4. To develop the skills to utilize community resources for teaching; and

5. To develop a strong sense of mission for the development of community and the nation.

In this connexion, various instructional materials (e.g. case-book, teachers' guide, work book, modules and other materials for exhibition, etc.) have been developed co-operatively by the schools, the Provincial Boards of Education, the Korean Educational Development Institute, the National Institute of Education and the Ministry of Education.

A. Methods to identify the elements of the materials

The processes by which these materials are developed are as follows:

1. Analysis of educational needs and problems through survey and research studies;

2. Specification of educational objectives on the basis of the analysis of educational needs and problems in a community;

3. Development of educational contents for Saemaul Education;

4. Translation of educational contents for Saemaul Education into actual material development; and

5. Development of instructional materials.

B. Strategies to implement the materials

Various instructional materials have been developed, such as: (i) case books; (ii) teachers' guides; (iii) student work books; (iv) test materials; and (v) other materials including instructional modules. These materials have been used, tried out and refined in schools, teacher training programmes and various other educational institutions.

C. Training of teachers and other personnel

Administrators and supervisors on the job are periodically brought to the National Institute of Education for orientation on Saemaul Education.

A three-tier programme of central, provincial, and local school level is in operation for different levels of administrators, principals, supervisors and experienced teachers. The classroom teachers are trained in their respective teaching settings in the community.

The Korean Educational Development Institute (KEDI) also trains experienced teachers for development of instructional materials and their use. The KEDI training programme is centred around actual experiences of teachers on curriculum development and instructional materials useful for classrooms and other teacher training programmes.

D. Problems and issues

Problems and issues encountered in the development and use of materials are as follows:

1. Lack of appropriate materials to meet the learning needs of the students in the community;

2. Difficulties in recruiting experienced teachers to be able to develop the instructional materials;

3. Difficulties to get sufficient time to devote to material development due to heavy teaching load;

4. Difficulties in managing overcrowded classroom when instructional materials are used.

The strategy used to overcome the above problems is the efficient application of an incentive system by which teachers are awarded for their outstanding services. Three kinds of incentive measures are adopted,(i) promotion through their merit;(ii) giving opportunity to teach in the better schools; and (iii) awarding of prizes to industrious participants.

E. Mechanism of evaluation

Outcomes of the Saemaul Education Programme were assessed in three phases: weekly or monthly, semi-annually, and annually, in terms of diligence on the part of the participants involved in the Saemaul Education Project, and effectiveness of the materials produced by the participants.

Review and examination of the results of the Saemaul Education have frequently been made in order to provide the incentive to those participating institutions and persons for their outstanding service.

Malaysia

The Development of Primary Science Instructional Materials in Malaysia (by Mr. Kamaruddin bin Hussin)

In 1968, a Special Primary Science and Mathematics Project was established within the Ministry of Education. The immediate task of the project was to provide whatever facilities and services are possible to help teachers improve their methods of teaching science and mathematics in the primary schools. It was not a research project but an implementational undertaking.

The specific objectives of the project are:

1. To prepare teachers' guide (grade 1 to 6);
2. To set up Teachers' Centre;
3. To train key teachers to help run courses at the state and district levels; and
4. To set up a network of communication system.

A. Methods to identify elements of the curriculum for primary science teacher education

It has been decided that the existing syllabuses will still be used, but the rationale was to concentrate more on the pedagogical aspect, namely, to introduce a new approach. It was hoped that this would give confidence to the teachers in trying out the inquiry approach on content with which they were already familiar.

In general, the teachers' guide for primary science follows a certain format. First, the major topics formed in the syllabus of a given standard or grade are organized into units. Each unit is then divided into sub-topics. Each sub-topic consists of suggested learning activities. The writing was done in a linear manner, namely, beginning with grade 1 and proceeding grade by grade, until all the six grades had been completed. To-date, 12 books have been produced.

B. Strategies to train primary science teachers

The key teachers who were trained by the project staff at the national level, in turn, train other primary school teachers from schools

that are adjacent to the Teachers' Centre. The Centre was the focal point in the district where trained key teachers, reference materials, basic equipment, workshop tools and other resources were made available to teachers in the area.

In order to implement the project effectively, a batch of 23 key teachers had been selected to function as district primary science and mathematics supervisors. They had to work very closely with teachers, supervising them in their daily teaching, and helping them to develop some science kits through workshops held in various schools.

Being an implementational undertaking, there was no built-in systematic evaluation in the project. However, qualitative evaluation has been going on since the early stages of the implementation. And in 1972, two years after the guides were used by the teachers, qualitative evaluation questionnaires were randomly distributed to 1,400 teachers. These questionnaires were designed to provide information regarding physical conditions in the schools, academic and professional training of the teachers, teachers' reactions to certain sections of the guide notes, teachers' perception of the children's responses, questions and activities of the guide, etc.

C. In-service training programmes and the development of modules

To-date, almost 50,000 teachers have been trained in the use of the teachers' guide. These teachers, despite having attended the in-service courses from the qualitative evaluation mentioned earlier, still need more assistance to understand basic content concepts in science and mathematics. Therefore, as an offshoot of this project, another project known as "The Multi-Media Self-Instructional Module" was set up. This project is for the upgrading of selected substantive and pedagogic skills of the primary school teachers. At present, only two sets of modules are developed:

a) Electricity; and

b) Decimal fraction.

Each module consists of the following: (i) a set of booklets containing basic academic information; (ii) learning kits for teachers to go with (i); (iii) teaching manual; and (iv) slide and tape to accompany teaching manual.

The trial version of the module on electricity has been completed. The module on decimal fraction will be completed by the middle of 1979.

D. Problems and issues in the development and use of primary science teacher education materials

1. Time element in developing curriculum materials is very important. The cost of hurriedly developing any curriculum material will be more than whatever time is gained in pushing through the poorly-conceived crash-programme;

2. Most teachers tend to resist curriculum change and view the innovative ideas as an additional burden to an already overloaded programme. The task of curriculum developers is not only to introduce new ideas but also to help teachers perceive the new curriculum materials as reducing their burdens;

3. If teachers can be invited to get involved in the project from the start, they are more likely to view the programme as a means of solving their problems and their commitment at all levels is assured;

4. Personnel with high qualities such as curriculum developers are not easy to recruit. Therefore, those personnel who have proven themselves as suitable curriculum developers should be given recognition and remunerations in keeping with their greater contributions to improve the quality of education.

E. Mechanism of evaluation

The drafts of the module on electricity were tried out initially with 20 primary school teachers prior to being printed for broader retrials. The materials were then revised on the basis of this evaluation. The opinions of experts, inspectors of schools and lecturers from teacher training colleges were also obtained for this purpose. Although the materials have been modified, a final evaluation has yet to be conducted before the materials can be recommended for nationwide implementation.

Malaysia

Experiences of RECSAM in Developing Science Instructional Materials (by Mr. Chin Pin Seng)

One of the major projects of RECSAM, supported by participating Member States in Southeast Asia is the development of innovative science and mathematics instructional materials at the primary level known as "Southeast Asian Science and Mathematics Experiment" (SEASAME). One innovative feature of this project, started in 1973, is its being research-based covering a full cycle of a curriculum package with the following stages: (i) designing and development of teaching modules; (ii) evaluation of materials; (iii) production of in-service materials; (iv) rural and urban classroom trials in member countries; (v) systematic means of collecting data, analysing and feedback to the centre for revision of trial materials and modification of methods and strategies for next year's series of modules and other package materials.

Other innovative features are:

1. The use of the 'systems concept' as an organizing principle for the project as well as selected topics and modular lessons;

2. Correlation of science concepts and methods of teaching; and

3. An integrated approach is used as selected personnel for a writing team are representatives of the heterogenous groups of teaching and education personnel.

The main objectives of the project are in line with the basic educational objectives of member countries for a science-oriented society capable of contributing to the development process. The project strives to teach a child to be able to look at things in various related ways and also aims at teaching him to apply process skills of science and systems approach in dealing with day-to-day situations. Multi-media approaches will be given to learning of basic concepts relevant to the needs of children.

SEASAME is an action-oriented project that includes all the necessary elements of on-the-job training for key educators from the region in order that they can, on their return, become resource personnel for carrying out all aspects of indigenous curriculum development themselves.

A. Methods to identify elements of instructional materials

The selection of instructional topics for the project is done by the writing team from the list submitted by member countries. It is based on the extent to which topics can provide simple systems concepts. Another criteria is the functional aspect of the topics in the context of actual situations in various member countries.

B. Strategies used to develop instructional module

The short list of topics are classified into one of the systems: natural, manipulative or conceptual. The major systems relationships of each topic are then identified. Each unit of four lessons consists of the following features: (i) rationale; (ii) overview of lessons; (iii) unit objectives; (iv) significance of the lessons; (v) teaching/learning materials and (vi) bibliography.

As an example, the rationale, the analysis of concepts and systems relationship of the unit 'Warming Up' for grade 5/6, module objectives, materials required are given in the report. Each lesson consists of the following parts (i) objectives; (ii) concepts; (iii) materials; (iv) preparation; (v) suggested procedure (instructional techniques and worksheets). The lesson, 'Warming Up' is given as an examplar lesson.

Instructional materials used are low-cost materials, simple improvised teaching aids and apparatus, diagrams and worksheets, thus, making learning science 'by doing'available to rural schools.

C. Training of personnel

The major activities of the Southeast Asian Regional Centre on Education in Science and Mathematics (RECSAM) in Penang, Malaysia, are 'on-the-job' training of key personnel from Member States in various areas of science and mathematics curriculum development, including the development of innovative examplar science and mathematics instructional and evaluation materials for the region.

The yearly programme is unique in many respects. Key education and experienced teaching personnel from various Southeast Asian countries, with their diversity in educational systems and cultural background assemble together at the Centre to identify and study common problems and co-operate by using their expertise and ideas together in developing examplar teaching/learning and other resource materials in order to supplement national efforts in improving the quality of science and mathematics education, especially for rural development.

D. Problems encountered in the development of instructional materials

1. The try-outs indicated that it was more relevant to apply four rather than eight different systems relationships in the development of instructional materials for primary pupils.

2. The evaluation instrument "Selected classroom interaction observation schedule" needed further simplification and reduction of items to more manageable ones by observers.

3. Modules should provide a wider range of alternatives in respect of teaching techniques, learning materials and activities.

4. There was still a tendency for writers to include too much content in individual lessons.

5. There was also a tendency to use technical terms rather than simple or familiar words in the lessons or activities.

6. Revision of modules could not be carried out by original authors after the feedback. This imposes some limitations in the finalization of modular materials.

E. Mechanism of evaluation

The most effective evaluation instruments developed for the project are: pupil achievement test; pupil interest inventory; teacher perception questionnaire; and selected classroom interaction analysis. In addition, an in-service manual for the project has been developed by a separate group of selected personnel from Southeast Asian countries for trial teachers and evaluators. The teacher's perception questionnaire is given as an example to illustrate the scope of feedback from teachers.

The feedback from children in the try-out classes indicated that the majority of urban and rural pupils stated that although they enjoyed doing the various class activities, they preferred to learn 'by listening' rather than 'by doing'. Evaluation data also showed that there was no significant difference using the teacher approach and the group activity approach.

The feedback showed that simple systems concepts are achievable through the units. They can be applied to real life situations and provide for the acquisition of science and mathematics concepts and processes.

The feedback showed that simple systems concepts are achievable through the units. They can be applied to real life situations and provide for the acquisition of science and mathematics concepts and processes.

The mid-term review of the project in 1977 by country delegates at a regional seminar gave wide support for the role of SEASAME project in curriculum development at the national level. SEASAME has provided a growing pool of key personnel returned from RECSAM with enriched experience and expertise in various aspects of curriculum development and has provided a package of examplar instructional, in-service and evaluation materials which have been tested and revised. This package can serve as resource/reference materials for development of curriculum materials in their own programmes.

Pakistan

The Development of Primary Teaching Kits in Pakistan (by Mr. Mohammad Aslam Popalzai)

The education policy (1972-80) recommended a variety of measures emphasized the improvement of teaching methods and the provision of instructional materials and teaching aids to primary schools.

In order to implement these recommendations, a National Committee on Teaching Kits was formed by the Federal Ministry of Education for developing a primary teaching kit.

A. Methods to identify the elements of the instructional kit

The National Educational Equipment Centre (NEEC) Lahore, was given a leading role in the National Committee on Teaching Kits. This committee consisted of the country's key educators, science and mathematics educators, language and social sciences experts, engineers, scientists and elementary teachers. A series of meetings of this committee were held in NEEC in order to finalize the lists of equipment and the hands of the experts were chosen as part of the teaching kit.

B. Strategies uded to develop the prototype of the kit

1. A comprehensive list of items of the kit needed to conduct the selected activities was prepared;
2. Upon the recommendations of the National Committee the NEEC, Lahore was commissioned to develop a prototype of the teaching kit;
3. Production drawings of various items were prepared for the manufacturers after the approval of final prototypes;
4. The National Committee also decided that a teachers' manual on how to use the kits effectively should be prepared;
5. Teachers training were organized by the National Institute of Teachers Education and the Provincial Education Extension Centres both for pre-service and in-service programmes;

6. On the basis of continuous follow-up and evaluation programmes, the kit was further revised after one or two years.

Mass production and quality control

The teaching kit consisted of instructional materials covering a wide range of school subjects in science, mathematics, social studies and languages. There was also a teacher's tool kit consisting of tools and instruments.

For the purpose of mass production of the kits, procurement orders were placed with manufacturers registered in metal work, wood work, plastic and printing.

A quality control section has been established at NEEC. All the items received from the manufacturers were quality-tested. The accepted items were sent to the stores while the rejected ones were sent back to the manufactures. The items were packed in the kit box in the assembly lines for distribution to schools. NEEC is responsible for sending these kits to the district headquarters through the district education officers.

Every kit was accompanied by a beautifully printed Teachers' Guide. This manual contained everything the teacher wanted to know about the items of the teaching kit. The writing work of this manual was entrusted to a sub-committee whose members were drawn from various subject committees of the National Teaching Kit. The writing work of this manual was entrusted to a sub-committee whose members were drawn from various subject committees of the National Teaching Kit. This manual covered the following information:

1. General description of each kit item i.e. its main specifications, etc.;

2. The classroom activities that can be performed and the concepts that can be explained with the use of the kit items; and

3. Safety, maintenance and duplication of the kit items.

C. Training of teachers on the use of the kit

1. In-service programmes. The Federal Ministry of Education has established a National Institute of Teachers Education to organize orientation workshops to train 2,200 teachers trainers who would ultimately train 200,000 teachers at the school level.

2. Pre-service programmes. With the introduction of National Teaching Kits in the primary level curricula, it was necessary that the existing Primary Teaching Certificate (PTC) programme should be revised incorporating the component of teaching kit as an integral part of the pre-service teacher training programmes in the country. Keeping this consideration in view the National Curriculum Bureau has revised its PTC Curricula in which the special teaching kit component has been added

to enable the pre-service training institutions, to integrate the use, and maintenance of the teaching kit in their training programmes. Thus, the teaching kits have been completely integrated both in the in-service and pre-service teacher training programmes.

D. Problems encountered in the development of the kit

1. The kits are usually sent to the district headquarters on the pre-determined scheduled time, but it takes a long time to reach the schools and the kits are kept lying in the district education office for one to two months' time.

2. There are evidences of lack of interest taken by the district duration authorities in directing the school teachers to collect the kits.

   As the district education officer is responsible for multifarious types of duties, he does not find sufficient time to attend to this project. The problem can be solved by establishing a small distributing section at the district level. This section would be looking after the following aspects:

   a) Distribution of the kits;

   b) Organizing the safe custody of the kits; and

   c) Motivation of the teachers to use and maintain the kits in the proper way.

3. The training of 200,000 primary teachers is a huge task. Until and unless this is done, kits would not be used by the teachers. The problem is being taken up and the teachers' training programmes are being organized at the in-service and pre-service levels.

4. There are a few imported items in the kit like thermometers, torches and magnets, etc. Sometimes the supply is disrupted due to the non-availability of these items and at the same time they are more expensive as compared to other indigenous items.

   Attempts are being made to obtain facilities to produce these items at NEEC, on a mass scale.

5. The teachers and the administrators take less interest in sending the feedback information in order to evaluate the project. This problem can be solved by starting an incentive scheme so that the teachers who take interest can be rewarded properly.

E. Mechanism of evaluation

The development of the kit, publication of the manual, establishment of the in-service teachers' training programmes for primary teachers and the distribution of kits needs continuous evaluation in order to make it an on-going project.

Five dimensional studies for evaluation have been undertaken as follows:

1. To study the effectiveness of the system of kits distribution;
2. To study whether or not the kit is being properly used;
3. To study the effectiveness of the kit items;
4. To evaluate the teachers' manual as a guide for using the kit; and
5. To evaluate the in-service teacher training programmes in the philosophy and use of teaching kits.

In order to carry out these studies, an evaluation cell has been established in the Ministry of Education. This cell has developed proformas for various activities. These proformas were sent to schools along with the kits. The completed proformas were received back in this cell and served as feedback information on various aspects of the kit. The kits were then revised or modified in the light of these suggestions.

Philippines

Integrated rural development through science education (by Dr. Rosalina R. Villavicencio)

The concern of the Philippine Government on rural development has initiated programmes and created offices that will take over the responsibility of transfering science and technology knowledge to villagers. As a curriculum development centre, the Science Education Centre through the Biology Workgroup decided to start a project on a community-based science and technology education which would simultaneously satisfy environmental education within the ecosystem and real-life situations of the learner. It was resolved that instructional materials and strategies for learning science concepts from the environment will be designed.

A. Methods to identify the elements in the curricula for integrated rural development

The topics developed in the material is based on forest ecology and conservation as the starting point of a community-based science and technology education. In addition, other aspects of life in an upland village were also considered such as the influence of social institutions, economic activities, cultural practices, health and nutrition, and educational facilities.

The choice of the upland community was based on the size and activities of the community affecting the forest and the presence of an elementary school. The school was used as entry point to the community. Permission from the regional office of the Ministry of Education and Culture was secured in this activity.

To assess the needs and resources of the community the participant observation method was used by which five or six field investigators lived in the village for three or four consecutive days until they became part of village life. During this time the field investigators participated in the village activities like farming, household chores or feeding farm animals. In the process they interviewed the villagers. The interview covered the following parameters; (i) economic activities; (ii) community structure; (iii) natural resources; (iv) beliefs and practises associated with the forest and (v) extent of knowledge on forest conservation.

Another method of gathering data was through document analysis of available community data from the municipal hall. The data was collated and discussed during a workshop. The ideas generated during the workshop guided the design and approach/es to be used in the development of the materials.

The results of the needs and resource assessment helped in the identification of core elements of the materials to be developed. The topics included were: the forest as a living system; agroforestry and its science principles; forest and wildlife conservation; livestock farming, economic alternatives; and health and nutrition education.

B. Strategies used in the development of instructional materials

The design of the instructional materials reflects the indigenous developmental framework evolved by the community during the needs assessment. The materials follow the cycle of design of materials, i.e., writing of module or learning activity, discussion of manuscript, revision of manuscript for try-out, feedback collection and revision in its development phases.

The materials took various forms. Through this strategy it was considered that the materials will find its way in the formal, informal and non-formal system of education. The instructional materials are as follows: (i) modules in the form of comics strips illustrating the basic principles of forest ecology, agroforestry, economic alternatives, and community health and nutrition, (ii) short modular science experiements, (iii) songbook; (iv) book of poems; (v) reader series and (vi) educational games, and radio broadcast.

The field investigators came from various disciplines, namely: science education, forestry, psychology, biology, medicine, and nutrition. The instructional materials were developed in an interdisciplinary manner. Once developed, the field investigators went back to the community to try-out the materials. During the try-out, the field investigators collected feedback on the ease of understanding the ideas or concepts by the villagers, suitability of the language, proper sequence of ideas and topics and appropriateness of language and composition to the target population.

The teachers served as observers on the feasibility of the materials. They used the prescribed materials for their pupils, recorded comments and made suggestions for the revision of the materials. The teachers and the barrio captain collected reactions on the use of the instructional materials from the adolescent and adult members of the community.

C. Training of teachers and other personnel in the development of materials

The field investigators were trained in the use of the scheme of observation to be used during the interview. Except for the full-time science educators who led the field investigators, the other field investigators did not have any formal training in the design and development of materials. The capability was developed as the project progresses with the guidance of the science educators.

During the try-out, the teachers, barrio captain and youth leaders were given informal instruction on the manner of collecting feedback using the questionnaires constructed by the field investigators for each module.

D. Problems encountered in the development of materials

There were some problems during the development of the instructional materials. There was a paucity of the historical record of the community in the municipal office, hence extensive interview during the participant observation was necessary. The transportation system made more difficult the frequent visits to the village. There were limited facilities and manpower in the community. The conflict in the time needed during the try-out and farm activities was another problem. There was difficulty in developing a material from a base of interdisciplinary knowledge at the same time teaching proper attitudes, values and adpirations related to the physical environment.

E. Mechanism for evaluation

The mechanism for evaluation of the long-term effect of the developed instructional material has not been formally designed. However, there is an intention to consider the role of cognitive functioning and patterns of thinking among village folks as it affects behaviour modification and value internalization.

Thailand

The Curriculum Revision and Implementation Project in Thailand (by Mr. Swat Chongkol)

A. Methods to identify the elements of the core curricula for integrated rural development

The Ministry of Education appointed the Curriculum Revision Steering Committee in 1970 to revise and replace the 1960 primary and secondary school curricula. Several methods were used to identify the elements of the core curricula for integrated rural development. First, documentation analysis was made to analyze the relevant elements from research and workshop reports conducted by various departments and government agencies concerned including universities. Then, field work was organized to investigate further information and/or certain topics additionally needed to validate the relevance, feasibility and functional value of the data and information obtained from the documentation analysis. Workshop, seminar, committee/groupwork meeting are also organized to collect data, information, suggestion and recommendation. At the primary school level, curriculum materials are tried out in 65 trial schools followed by series of workshops and committee/group work meetings to finalize the final findings.

B. Strategies, methodologies and institutional arrangements used in the development of instructional materials for translating the core elements into teaching-learning materials and accompanying aids

The Curriculum Revision Steering Committee laid down the policy of inviting the widest possible participation from teacher, school principal, subject specialist, expert from disciplines related to education, supervisor, educational administrator as well as criticism and recommendation on education written or transmitted through various types of mass media especially newspaper and journal. Thus, when it comes to the committee and group work, representatives from these groups have the opportunities to translate the core elements into teaching-learning materials and instructional aids. Since the information obtained showed that majority of teachers resort to the easy but inefficient method of "chalk and talk" and use only one textbook, the strategy then is to develop a series of teaching-learning materials namely teacher's manual, lesson plan, and record/report form closely related to syllabi. There are always curriculum developers acting as core group representing in the sub-committee/working group when preparing teacher's manual, lesson plan, and record/report form in order to assure that the vital instructional objectives prescribed in the syllabus would be effectively translated and integrated into the curriculum materials and instructional aids. After the first draft and prototype of materials and aids were made, 24 schools teachers representing all 12 educational regions were invited to critically examine the products to validate the feasibility, functional quality and relevance to situation and needs of both national and local levels. Afterwards a group of consultants and editors (appointed by the Department of Educational Techniques) would jointly meet with the members of the sub-committee/working group. Such joint operation was made twice during the total period of development which normally lasted from one to six months depending on the type of materials. Since Thailand has trial project to try out curriculum materials for primary school, the aforesaid materials and aids were tested, evaluated, and revised before mass production and nationwide implementation.

C. Training of teachers and other personnel in implementing community education and development

Before starting the work of designing and development of curriculum materials, members of committee/sub-committee/working group attended a one day seminar followed by the actual writing/preparing of the materials. During the period of preparing such materials, regular meeting of group chairman and general meeting of all members were held. Drafted materials were later tested in either 65 trial schools (for primary school curriculum) or in certain selected schools for mini-try-out. Before nationwide implementation a group of trainers was selected to attend a two week training course. Then these trainers organized a series of in-service training for subject heads in secondary schools. As for the primary level another set of trainers were selected to attend the training programme followed by a series of in-service training programme of all primary school principals and one academic teacher from each school. Nevertheless, the Provincial Administration Authority also held in-service training programme for all grade I teachers (Thailand implements their primary and junior secondary school curricula grade by grade i.e. grade I and VII in 1978, grade II and VIII in 1979).

All educational administrators, and supervisors attended a two day orientation seminar. In addition, all deans of the faculty of education from every university, all principals of all 36 teachers' colleges, all chairmen of the provincial council, assistant governors from every provinces, all councilors,(educational affairs) from municipality council also attended two day orientation seminar. These people were informed of curriculum changes, their responsibility and role in connexion with nationwide curriculum implementation and its improvement.

D. Problems encountered in development and use of instructional materials and training procedures

Insufficient budget was the main constraint affecting the standard of training programme in terms of number of trainee duration of training and shortages of training materials. It also constituted to the problem of inability to apply effective training techniques, provision of necessary inability to apply effective training techniques, provision of necessary instructional aids, and operation cost concerning supervision, follow-up and evaluation of the effective teaching-learning activities carried out at school. Furthermore, the aforementioned constraint also led to the problems of efficient revision of curriculum materials and instructional aids.

E. Mechanism and procedures for continuous evaluation

The Ministry of Education appointed the Curriculum Implementation Steering Committee comprising high level administrators responsible for primary and secondary schools as well as representatives from Department of Teacher Training and Budget Bureau. Its chief responsibility is the policy making, decision making, co-ordination, supervision and evaluation of nationwide curriculum implementation. Reports on training of teachers, supervision for effective organization of teaching-learning activities, and follow-up evaluation of total school activities are required for this committee through the Department of Educational Techniques which is the responsible government office concerning curriculum development. After discussing problems and issues obtained from such reports,suggestions, recommendations and issuance of regulation/order to solve the problems/ issues as well as improvement of educational standard are made.

In terms of continuous evaluation, the Curriculum Development Centre conducts regular visits to both trial schools as well as others with a view to gathering data and information to revise syllabi and curriculum materials. This measure can be regarded as "self evaluation" or "formative evaluation" conducted by an official unit directly responsible for curriculum development. The Educational Research Division of the Department of Educational Techniques conducts evaluation to investigate the effectiveness of curriculum try-out and curriculum implementation. This is regarded as "external evaluation" or "summative evaluation" for the Curriculum Development Centre and at the same time this measure also serves as "self evaluation" for the Department of Educational Techniques. In addition to this, the office of National Education Commission will conduct evaluation of the outcome of nationwide implementation in 1981 and 1984 with a view to assessing the efficiency and effectiveness of the use of syllabi, curriculum materials and instructional aids. Such

measures are expected to help the Ministry of Education in revising and improving syllabi and curriculum materials which eventually would improve educational standard as a whole.

Chapter II

VISITS TO INSTITUTIONS WITH INNOVATIVE PROJECTS

Following the participants' presentation of their experiences in developing instructional materials, a study visit was organized to two selected secondary schools* and a teacher training institution. The places visited were: 1) Kumpawapi Secondary School, Kumpawapi District, Udorn Thani; 2) Nampong Secondary School, Nampong District, Khon Kaen; and 3) Udorn Thani Teachers' College, Udorn Thani. The purpose of the visits was to acquaint the participants with selected rural schools and their programmes geared to community development. The participants observed the actual implementation of the curriculum particularly in the areas of health/nutrition, skill training and rural development. The visits were also designed to show the efforts of the schools on rural development and their impact on the development of the surrounding communities.

At the teachers' college participants were presented a number of activities. Prominent among them was the development and use of low-cost instructional materials for pre-service and in-service teacher education.

The details of the visit at each institution follows.

Kumpawapi Secondary School, Udorn Thani

A. Background

Kumpawapi Secondary School was established in 1948. It is now offering two parallel curricula: one is the old curriculum for grades 7 to 12, and another one is for grades 6 to 12. The school is situated about 43 kilometers from the city of Udorn Thani. It has 1775 students and 72 teachers.

In 1977, the school was selected to experiment on a curriculum for rural development. Since then several activities relating to the area have been undertaken by the school.

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* These schools are two of the ten schools under the experimental programme which was recommended by the In-country Training Workshop organized by the Ministry of Education at Udorn Thani, Office of Education in May 1977 under the APEID Mobile Team Workshop in Curriculum Development.

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B. Description of the activities

The on-going projects of the school include the skill training, home economics and vocational activities relevant to the needs of the community. The application of the curriculum for rural development was made by organizing a survey study of the needs of the community in specific areas such as occupation, income, family health, and sanitation, etc. The data collected were analyzed and translated into curriculum programmes. During the visit, the activities observed by the participants were the following: clothes making, use of domestic and farm waste materials, food preservation, making fertilizer from decomposing waste matter, seeding and plant reproduction, soil improvement, development of recreational areas, bicycle repairing, stove making, livestock breeding and paultry management.

C. Observation and comments

The participants were impressed by the variety of activities provided by the school. Efforts made by this school to train the students to serve the community by making use of local resources were appreciated by most of the participants. However, some believed that it would be more worthwhile to see how the experiences in the school are being transfered to the community. The participants inquired if sharing of ideas and experiences among schools in the vicinity is conducted. They believe that this would be fruitful and beneficial in accelerating the involvement of the community.

Nampong Secondary School, Khon Kaen

A. Background

Nampong Secondary School is situated in Khon Kaen province. It is about 32 kilometers from the city. The majority of population in this district earn their living on agriculture and freshwater fishery. Since 1977 the school has launched several projects to introduce the people in the community to modern agricultural technology to increase production and to learn how to make better use of local resources.

The specific objectives of the projects are:

1. To obtain co-operation from the community in using local resources for translating vocational curriculum into practice;
2. To provide the community with new knowledge and technology to increase their income and productivity;
3. To provide services to the community in eliminating plant and animal diseases including health services; and
4. To promote better living conditions to the people in the community.

B. Description of the activities

In a slide presentation the participants were informed of the various activities undertaken by the school. Following the presentation, they were exposed to the actual on-going activities of the school and of

the home projects conducted by the students. The projects seen by the participants at the school were as follows:

1. Cow raising and breeding;
2. Mushroom cultivation;
3. Multiple crops;
4. Vocational activities of common interest to certain groups in the community;
5. Farm fair;
6. Community service;
7. Water supply; and
8. Fishery.

In addition the participants visited the homes of two students to observe a lemon plantation and a frog farm. Both projects were carried out by the students themselves.

C. Observation and comments

The participants were very much impressed to see excellent projects carried out by Nampong School which turn the school into a community learning centre. The school's efforts to serve the people of the community with particular projects by using local/school resources were also appreciated by most of the participants. Suggestions were made by some participants that the school should explore the feasibility of training teachers from other schools and also provide consultant services to a small group of farmers. Others, recommended that projects should be selective to ensure effective results rather than trying to launch all projects at the same time. One participant suggested that a skill in the maintenance and repair of auto and farm machinery may be started if these machines are used in the farms. This will encourage the adoption of mechanical farming and hence, increase agricultural productivity.

Udorn Thani Teachers' College, Udorn Thani

A. Background

Udorn Thani Teachers' College is situated in the city of Udorn Thani province which is about 570 kilometers from Bangkok, the capital city of Thailand. It is one of the eight teachers' colleges in the northeast region of Thailand. The college is responsible for both pre-service and in-service teacher education degrees programmes in the area of Udorn Thani and Nongkhai provinces. The major objective is to train teachers and educational personnel to serve the needs of the northeastern region.

The emphasis of teacher training is primarily on pre-service programme. Findings from case studies and other systematic forms of questionnaire reveal that there is a need for more in-service training programmes. Training centres of the in-service programme are located in different local areas of Amphur (district)in order to serve the

community in the area of education for rural development. Local resources and materials are designed and developed to be used particularly for distant and open learning.

B. Description of the displayed projects and activities

All participants were taken to the college to visit the following centres:

1. Centre of teaching aids, Department of Education.

   The teaching aids being displayed were made from local low-cost materials to be used for instructional purposes in each subject matter area.

2. Centre for the production of science and mathematics audio-visual materials.

   The materials being displayed were those used by instructors in teaching science and mathematics. They were made of low-cost as well as high cost materials.

3. Centre for extension and student field works.

   The materials shown are local and low-cost to be used for student teaching practice and for services to local schools.

C. Observation and comments

Most participants were impressed with the well-organized set of laboratory equipments, use of local resources and materials and the instructional facilities made available for instructors and students of the college. Suggestions were made by some participants regarding the following:

1. Modular approach should be devised along with the teaching techniques and science/math demonstration;

2. Teaching aids should be developed on the basis of concept analysis;

3. Maintaining of the materials for longer usage should be devised;

4. All activities should be related to the application of knowledge and skills as parts of integrated teaching competency;

5. Attempts should be made to stimulate the students to utilize and develop local resources as teaching aids; and

6. Science teaching materials should be developed from local resources. Talented teachers with aptitude for research and development of low-cost science equipment may be encouraged. These efforts may serve as the guiding force in the establishment of a "Creativity Centre: Reserving teachers may be rewarded in varied forms (additional income for developing low-cost materials, promotion, etc.)".

Chapter III

SYNTHESIS OF EXPERIENCES IN DEVELOPING INSTRUCTIONAL MATERIALS IN ASIAN COUNTRIES

The reports of the participants included experiences in curriculum development and designing of instructional materials in science and mathematics for primary and secondary levels and the design of teacher education programmes and materials. After the presentation of reports and the three study visits, the participants were grouped according to the nature of materials to synthesize their experiences. Three groups were formed, namely: (1) Local and community resources; (2) Printed materials to implement the core curriculum; and (3) Other materials which may serve for enrichment and other purposes. The list of participants in each group is in Annex III.

The materials were examined by each group and the synthesis of reports was done in a plenary session. Five frames of references agreed upon by the participants were used as the basis for the examination of the materials. The group reports are presented as follows:

Group A. Local and Community Resources

Before an analysis could be made, the group found it necessary to define several terms. Local and community resources was defined as the available human resources and social institutions in the community, and the physical attributes and resources within and around the classroom that may be used as learning materials. Integrated rural development was defined as a systematic approach for working together to improve the quality of life and to develop human resources in the community. These would mean that the rural development programme should be compatible with the ecology of the community, interdisciplinary in nature, and people centered. People-centered means that the target community should evolve the development framework according to their perceptions and aspirations, implement and evaluate such programmes and materials based on their evolved goals with minimum inputs from external sources.

The framework used by the group to improve the quality of life in the community is through the vehicle of education. This has implications on the design of relevant curriculum, upgrading of the quality of teachers and providing appropriate instructional materials. It does not mean, however, that the quality of life can be improved by education alone but should also involve other disciplines, agencies and institutions interested in community development. In the context of this analysis, the use of local and community resources was viewed as an approach to developing instructional materials and designing teacher education programmes.

A. Methods used in identifying the common and special elements in the core-curricula for integrated rural development

In analyzing the core-curriculum, the following questions were asked: (i) What are the opportunities and resources available in the community? (ii) How are the local resources used? (iii) How do the value systems influence the activities for development in the community?

The common elements in the core-curriculum were identified based on the expressed needs and aspirations of the people, activities for and by the community, and the alternative course of action related to problems of the community. Based on the basic minimum needs of the people, three special elements were identified, namely, health and nutrition, clothing and shelter, and education.

The conscious effort to identify core element of the curriculum for integrated rural development involves the consideration of national policies or objectives for national development. The machinery of the national government at the level of ministries and bureaus set guidelines to translate such policies into national goals, and to direct its implementation.

Another method to identify the core element was the use of interdisciplinary needs and resource assessment procedure which may be in the form of survey questionnaire and interviews conducted by local agencies. Selected field specialists in different disciplines and curriculum developers serve as resource persons in the development of instruments and data collection.

As expressed in the framework, the quality of teachers and the programmes that prepare them is an important consideration for integrated rural development. Within this framework, the perceptions of teachers on their new role and the methods to prepare them for this new role were analyzed carefully. Hence, the pre-service and in-service preparation of teachers for rural development was examined in terms of its objectives, approach and effectiveness. After serious deliberations, a set of criteria was generated with regards to teacher education for rural development. These criteria were as follows: (i) balance between theoretical courses on community education and practical experiences which actualize the principles of community education and community development as demonstrated by the integrated teacher education of India, community based teacher training programmes of Thailand and Sri Lanka; (ii) the development of community - based training programmes to render the teachers more creative and skill-oriented as examplified by the teacher education programme in Thailand, Sri Lanka and in Jeonbug National University, Korea; (iii) the teacher's role and the school as a community centre as reflected by the core-curricula of teacher training colleges in Thailand, the Philippines, Sri Lanka, Bangladesh and the Saemaul Movement of Korea; and (iv) the cultivation of sound attitudes toward rural community life among prospective teachers.

These criteria were derived from various methods used to identify elements of the core-curricula for teacher education in rural development. These methods were: (i) examination of principles and

strategies of non-formal education; (iii) use of tools of evaluation, i.e. surveys and questionnaires to find out the attitudes and perceptions of teachers on their role as change agent; (iii) study of the level of abilities of prospective teachers recruited from the villages; (iv) participant observation which exposes the teachers and students to real-life situations; (v) case studies of specific communities; and (vi) progress reports and studies conducted by volunteer agencies, and community organizations.

B. Strategies, methodologies and institutional arrangements used in the development of materials for translating the core elements into teaching-learning materials and accompanying aids

In designing strategies for translating the core elements to teaching-learning situations, the following elements were considered:

a) The students. What are their abilities to learn? What is their pace in learning? Are learning resources available to them in the community?

b) The teacher. What abilities are necessary to teach community development? What is his attitude towards community development? What is his perception of his role in community development?

c) The environment. What are the available resources and situations that serve as learning materials? Do the available resources and systems lead itself to change or modification?

When the factors had been considered, then institutional arrangements to facilitate the design and development of instructional materials and to conduct training programmes were made through direct verbal approach, signed contracts (e.g. Memorandum of Agreement), formal letters of involvement, and committee meetings. Usually, the school is the centre for all these activities. As such the strategies to solicit teacher participation becomes critical. Measures that proved effective were the exposure of teachers to the actual or similar areas, the conduct of orientation meetings on the community-based programme to school administrators and concerned agencies (government or non-government) and encouragement of the co-operation of student and other personnel among educational institutions.

Since a community-based programme was dependent on teachers to develop instructional materials and/or conduct training programmes, an intensive orientation was given. Usually such programme trained him to become keen about the environment and its usefulness to learning situations, and to inculcate leadership in organizing the physical and social environment for community education and development.

C. Training of teachers and other personnel in implementing community education and development

The effective method of training teachers and other personnel for community development is in the form of direct interaction with the community or with the environment. This should be done in such a way that skills become more relevant to the needs of the community and sound attitudes for rural work are developed and strengthened.

Other forms of training may be done through distance learning such as informal systems of education via the print, audio and visual media; open learning as in extension training and mobile vans, self-instructional modular materials written in the community setting, self management learning where the learner devices his own programme and through conduct of seminar, workshop and summer institutes.

D. Problems encountered in the development and use of instructional materials and training procedures

The problems encountered in the development and use of instructional materials are related to data collection, role perceptions of teachers and community, effective use of materials, training of personnel, preparation of teachers and community workers, translation of core-curriculum to the development of instructional materials and design of teacher-training programmes, integration of disciplines, cultural shock experienced by trainees, lack of support from administration, and financial constraints.

Although participant observation seems to be the most effective and direct method of data collection, there are some complications in its use. In some cases, there is antagonism and suspicion from pressure groups with vested interests. When an outsider enters a community, there is a polarity of impressions of the community members and a conflict of leadership might ensue. Besides, the procedure of participant observation is time consuming. To minimize this problem the researchers need to deal directly with the people and confer with the recognized key leaders who have vested interest that may be affected by the project. The development projects should be discussed in public meetings and conferences to lessen conflicts between groups. In addition, the people should be involved in the project to help lesson the resistance. For those villagers who have different levels of problems for which perception and expression of their own needs may not be easily done, the use of key leaders and group organization to arrive at a general concensus is recommended.

The resistance of the teachers and the community to a community-based project may be due to ambiguous perceptions of roles and the threat to change existing value system. In this respect the community members may not co-operate in facilitating the development of instructional materials. Several solutions have been attempted to solve this problem. In most cases parents and teachers are organized to form a cadre of implementators in problems related to water system, sanitation, health and nutrition. In some countries, perceptions of the community regarding the role of the school in rural development have been changed by informal activities like village camps wherein teachers, teacher-trainees, local council and local people participate in meetings, workshops and conferences.

In many cases, villagers do not have an effective system of distribution or circulation hence, instructional materials are not used effectively. Some countries solve this problem by identifying a common point of contact by community members like a barbershop, a store, a reading centre, the school, temples and other places of workshop.

The lack of training personnel is a common problem for most countries. In this case, few persons are exposed to community work which may include the development of instructional materials and design of community-based programmes. To reduce this problem, intensive and regular training programmes are undertaken to create a pool of community workers. To make them stay in the job, teachers and other personnel are given incentives in the form of certificates of recognition which can be used for promotion purposes, financial incentives and fringe benefits like out-of-town allowance or free housing. In Nepal, there is a community National Development Service (NDS) where graduates are paid by the government for two years when they engage in the community development.

Some Asian countries fail to consider the component of community development in their curriculum for pre-service and in-service training programmes hence this renders the teachers inadequate in efficiently handling available local materials for use in teaching and unable to identify and relate environment to classroom situation. Some countries undertake a community based teacher education programme like the Saemaul Movement of Korea and teacher education programmes of Thailand and Sri Lanka. In this connexion the inclusion of competencies on community development in the present curriculum should be initiated. In-service training programme in the form of seminars and workshops on the techniques of identifying and handling of local community resources may be formulated.

Besides the inadequacy of teacher preparation, one of the problems of translating the core elements into instructional materials and teacher training programmes is the lack of congruence of school objectives and operations to community development. The experience of Bangladesh relates that agriculture is a production - oriented subject as advocated by the curriculum. However, the time given for the subject is not adequate, hence, agriculture is taught as an isolated and theoretical subject.

Apart from the lack of congruence in operations, the syllabus and content of textbooks seldom include the use of local and community resources. It was suggested that there should be a close co-ordination between agencies and those engaged in developing different types of instructional materials. Wherever possible integration of disciplines should be done. Methods of evaluation of performance of students in community development activities should be evolved.

Students and teacher trainees who did not come from similar communities experienced cultural shock at the initial exposure. Under such circumstance, favourable attitude toward community may be difficult to develop. To reduce this problem of adjustment, intensive orientation should be conducted.

Development and use of instructional materials

The centralized system of administration of educational programmes presents problems in facilitating the implementation of the community-based project. Under such system most projects will respond more to the central policies which take into account the national needs rather than the community needs. To solve the problem, most countries in Asia are moving towards decentralized system of educational administration which makes it less difficult to develop and implement a community-based project. This situation can be seen in Thailand and Sri Lanka where community-based programmes originate from the schools and are oriented towards the local community itself. Philippines whose projects start at the regional level also directs its programmes to meet community needs.

Sometimes the personnel in charge of administration of educational programmes is also a source of obstacle in implementing community-based projects. This problem stems from the lack of knowledge of administrators regarding the nature of community development programmes. To bridge the gap in knowledge regarding rural development, conferences, seminars and leadership training courses for school administrators are conducted.

Financial problems are generally present in community development projects especially when support of international and/or national agencies had ceased. Effective measures have been carried out in various ways such as soliciting leaders of the village to tap funds from various agencies, involving private and public agencies in similar projects, integrating budgets of different agencies with similar/related objectives for community development, and various fund raising activities like campaigns, sale of products, and collection of fees earned from services.

E. Mechanism and procedures for continuous evaluation

Various methods are employed in evaluating the developed materials and the training programme. More specifically the evaluation is based on the attainment of objectives, effectiveness of approach used, and quality of product. The methods to evaluate the materials include testing or try-out in the classroom, teacher workshop, feedback collection through questionnaire administered to teacher users. The methods employed to evaluate training programmes for teachers and other personnel are written reports to the school administration, self-assessment of teacher trainees, direct observation of school administrators during training period and post evaluation of training course by the student and the teachers college. Activities at the community level are evaluations in the form of instruments like a checklist, inventory of achievements, supervisors evaluation, peer evaluation, logbook to record daily activity and regular visits of administrators. In most cases the opinions of community members regarding the project were solicited through interview and questionnaire. Informal methods of evaluation were conducted through linkage with other agencies to evaluate action research studies, and presentation of reports in national conferences.

Group B. Printed Materials

The group decided to consider mimeographed materials as printed materials because together with press printed textbooks these materials are also used in Asian countries for educational purposes. The displayed educational materials were examined during discussion.

A. Methods to identify the common and special elements in the core-curriculum for integrated rural development

From the experience of participants, the following basic problems for rural development were recognized, about which motivations are to be created through printed materials - poverty, illiteracy, hunger, malnutrition, diseases, poor production of crops, epidemics, drought, famine, flood, exploitation and absence of educational facilities for all children and adults. In the printed materials developed by different countries attempts have been made to make them realistic and fully integrated with the environment such that they can promote interest. While developing textbooks, the need for developing functional literacy inside and outside the classroom has been kept in view and care has been taken to facilitate multiple entry into the educational system. It was observed that printed materials particularly in science stressed more on the development of scientific thinking in children. While presenting examples and activities, efforts have been made to replace contrived situations by things and occurrences in the environment.

B. Strategies and methodologies used in the development of instructional materials for translating the core elements into teaching-learning materials

The printed materials for teaching-learning and accompanying aids were of the following kinds, namely; syllabus, textbooks, workbooks, charts, laboratory manuals, text items, curriculum guides, posters, supplementary reading materials, kit guides, pamphlets, lesson books, journals, magazines, newspapers, correspondence lessons, teaching kits, teachers manuals, modules, charts and programmed materials.

In most Asian countries, the development of printed materials is usually initiated by Government Education Departments. In some member countries, Unesco and Unicef and some foreign agencies were involved in the development. Th[illegible]velopment of materials in some cases began as an experimental ba[illegible] initiated by individuals or institutions. A working groups for each subject area, consisting of subject experts, science educators, methods masters and classroom teachers was set up. Local or foreign consultants may be involved in some phases of the work.

Two types of methodologies are followed in the development of instructional materials. One method proceeds from the election of general objectives, identification of factors, writing draft manuscript, revision of draft manuscript, editing of the manuscript, printing, distribution, training of teachers and collection of field reports. The second method follows this procedure which comprises statement of goals of education, defining objectives, selecting contents, making table of specifications, writing the teachers' guide, conducting the try-out, revising the manuscript, printing and implementation.

C. Training of teachers and other personnel in designing, use and improvement of materials

The new generation of printed materials involves the participation of teachers in the development of instructional materials. However, in the experiences of the participants, the training and orientation programmes were organized more for the use than for the design and improvement of the materials. Many member countries have launched special programmes like distant learning programme in Nepal, village education centre in Bangladesh, techniques of classroom management in Korea, correspondence lessons in India, Sri Lanka, Korea and Thailand, and summer institutes in India. For each programme special kind of printed materials may be designed by the group who developed the materials or by specific designated group as in India.

In terms of using materials for a new curricula, pre-service and/or in-service training programmes are conducted in all member countries. Generally, the training programme emphasizes the preparation of lesson plans to offer more meaningful learning experiences for the use of the new curriculum. In Pakistan, in-service teacher training courses have been started by Allama Iqhal Open University. The instructions are imparted through sending the materials by correspondence. On qualifying the course, the teachers are awarded certificates and as incentive they are given advanced increments. Similar practices of reward to teachers are also employed. In the case of the primary teaching equipment kit of Pakistan, teachers' guide has been developed for the use of the kit and a training programme is conducted. Similar efforts are also going on in several countries like India, Bangladesh and others.

The personnel involved in the training programmes may be the same group of individuals who developed the instructional materials. In some cases, principals, science supervisors, school inspectors, district education officers, science educators and methods master may be involved in the training programmes as trainees and/or trainers.

D. Problems and issues encountered in the development and use of the materials and strategies used to solve these problems

The problems and issues may be classified under the three categories, namely; i) problems in preparing the manuscript, ii) problems in production of the printed materials and iii) problems of using the printed materials.

1. Problems in preparing the manuscript

In most countries planning for textbook production is the responsibility of an ad hoc committee composed of representatives from the Ministry of Education, school administrators, curriculum designers, and school teachers. The nature of ad hoc committee work may account for discontinuity and lack of coherence in the development of instructional learning package. The difficulty to find the qualified authors to write the instructional materials was expressed as a common problem in the member countries.

The paucity of research studies on children learning contributed to the poor perception of national goals and objectives. In most cases, the objectives were selected in a subjective manner and may not reflect the stated goals of education.

The content of the printed materials were sometimes unrealistic and does not reflect real-life situations. In some cases, teachers were not involved in the development of instructional materials and where teachers were involved they lack the prior orientation on their involvement hence they do not make significant contribution. The accompanying teachers' guide does not allow teachers to make necessary modifications in teaching strategy. If translation is done as in some Asian countries, difficulty to translate from English to different local languages may be due to the lack of good translators and inadequate vocabulary of the local language.

2. Problems in the production of the printed materials

In most Asian countries the good printing press that can allow a wide selection of varied types, screening and colour printing is almost non-existent. In addition, materials and services like good paper and proper binding facilities may advisely affect the quality as well as durability of the printed materials. The mechanics of printing and illustration, layout, and editorial procedures are problems in the printing of the materials. In some cases, there is lack of co-ordination between the author and the editor, hence, the ideas may not be communicated accurately.

3. Problems in using the printed materials

The absence of proper planning often prevented the distribution of printed materials in time to the target group. When materials were developed as several isolated packages, it became extremely difficult to ensure that all packages reached the users in time. The language, sophisticated presentation and use of contrived situations prevented the understanding of printed materials to the average users. Lack of preparation of teachers affected to use of the new materials. The present examination system was reported to be limited only to the routine memorization of facts. As grade obtained in the examination was thought to be all important in the life of the child, concentration was given more on the results of the examination than on the actual learning.

Several strategies had been used to solve the problems. Group discussions and seminars were conducted to orient different kinds of people on developing, implementing and evaluating printed materials. Efforts were reported regarding the development of printed materials on the basis of local needs, in local languages and by using local resources. Parent-teachers associations were reported to be used as forum to discuss about the need of stressing on actual learning than examination grades. The development of new kind of printed materials for non-formal and formal education is also going on in several countries like India, Thailand and others.

E. Mechanism and procedures for continuous evaluation

Continuous evaluation is done through the monitoring of feedback on teachers' reaction, students' reaction, visit to the classroom, review of student performance and review of the materials by people who are not directly connected with the work. In the revision of the correspondence lessons, feedback from teacher-users and comments and suggestions of reviewers had been considered.

Group C. Other Materials

As defined by the group "other materials" consist of printed materials, excluding textbooks,composed of students' text and accompanying teachers' guide, and the teaching aids and kits with printed manual of instruction for use. The printed materials included are instructional modules for student use, instructional modules for teacher training programme, teachers' manual on kits, trainers' manuals and primers, logbooks or diaries of activities, instructional aids, worksheets and information sheets, structured work plans, student-activity booklets, student assessment sheets and correspondence lessons. The materials that are not printed may come as teaching aids (maps, charts and posters), equipment items in a kit, educational games and apparatuses and instructional manuals in the mobile van. These materials are intended for student and teacher use, together or separately, for specific purposes.

The participating countries presented different fields of subjects, namely, science education like in the Philippines, Iran, Indonesia; science and mathematics education for Malaysia and in other core curricular subjects like social studies, English, Indonesian language; and skill development as in the case of Indonesia. Rep. of Korea, Pakistan and Thailand presented the development of their projects on teacher education, development of teaching kits and instructional materials, respectively. Projects/programmes reported by participants are in different stages of development.

A. Methods to identify the common and special elements in the core curriculum for integrated rural development

There are common methods utilized by the participating countries in identifying the common element in the core curriculum. Generally expressed was the use of field work operation, documentation analysis, workshop, seminar and committee group work meeting, and findings from basic research in learning. In the field work, most countries employed several techniques, namely, survey, interview, systematic observation, critical incident technique, inventory analysis and field test.

The core elements identified from the materials examined were derived from international concerns which were considered by countries and/or institutions as among their goals the ideology of fostering self-help, diligence and co-operation to express national identity, the relevance of education to skill development, operationalize educational objectives, and the use of environment to basic functional and competency-based education.

Some common materials developed for examplifying the core elements instructional modules (self-learning kits), teachers' manual and simple instructional aids. The special materials are worksheet and information sheet, structured lesson plan, student-activity sheet. mobile van, equipment teaching kit, educational game, casebook, and materials for exhibition.

B. Strategies, methodologies and institutional arrangements used in the development of materials for translating the elements into teaching-learning materials and accompanying aids

The importance of translating the core curriculum into teaching-learning materials has been realized by the participants from Asian countries. However, there are variations among participating countries with regard to the strategies, methodologies and institutional arrangements. The differences in strategies used may be due to the organization and scheme of the educational system, and in the nature and scope of problems and the variation of the target population.

In spite of the variations, there are similarities in the strategies used. Among these are the use of a heterogenous group of experts from different areas in education like experienced teachers, supervisors and subject matter specialists in the development of instructional materials. A research-development model is employed in the development of materials. This model proceeds from content analysis to identify concepts and activities, planning and writing lessons, experimental try-out, and the revision of materials based on feedback. Generally, school teachers participate in the development of materials only to give comments and suggestions for future revision, rather than a direct involvement in the design of the instructional materials and teaching aids. Most countries developed modules to enable group or individualized instruction using multi-media approaches to satisfy individual differences among students. Some materials were developed for non-formal education. An interdisciplinary approach done by pooling the efforts of experts from different disciplines was used in the development of supplementary instructional materials.

Teacher education materials for rural development had been developed by Rep. of Korea, Thailand, Sri Lanka and India. To identify teaching competencies for in-service training programme, critical incident technique was employed. Modules were developed in most Asian countries as supplementary materials for use in in-service training programme.

C. Training of teachers and other personnel in designing, use and improvement of materials

Various countries have different approaches in the design of instructional materials. Most countries designate certain institutions, outside their Ministry of Education, the responsibility of developing and organizing new curriculum materials to meet various national needs in education for rural development.

Development and use of instructional materials

The University of the Philippines Science Education Centre (UPSEC), the Korean Educational Development Institute (KEDI), the Science Education Centre in Iran, and the National Educational Equipment Centre in Pakistan have such responsibilities. The UP Science Education Centre develops materials for non-formal education as a project of the unit. There is no formal training for those education experts and other personnel in designing the instructional materials. The designing teams composed of full-time members of these institutions with part-time experts from other educational agencies and sometimes from professional sectors of the government and community involved with rural development. Workshops and seminars are held to develop the objectives and instructional design. The details in developing materials are usually left to the full-time staff members of these institutions.

Three other countries, namely, Malaysia, Indonesia and Thailand, and the SEAMEO Regional Centre for Education in Science and Mathematics (RECSAM), Penang, Malaysia, have different training programmes for personnel in the designing phase. The Ministry of Education of Indonesia, Malaysia and Thailand are responsible for new curriculum materials through their designated departments, namely, BP3K, and Curriculum Development Centres, respectively. The staff members of these departments together with educators, classroom teachers and other personnel hold workshops to formulate objectives and design instructional materials. The CDC of Malaysia follows this pattern of work and in addition, some officers in the CDC were sent to the U.S.A. or U.K. for overseas training in curriculum development after one or two years of full-time work in the Centre.

RECSAM is unique in that selected key educators from Southeast Asian countries were given on-the-job training at the Centre in the instructional design and development of curriculum materials. These key personnel exercise various capacities in education such as supervisors, educational researchers, senior subject teachers, college lecturers, curriculum writers and school principals. Every year, a new heterogeneous group of key educational personnel was given on-the-job training before they designed and developed teacher modules using system concepts as an innovative approach in organizing pilot projects, teaching units, and lesson plans.

All the Asian countries conduct formal training for the use of developed materials. The training is done at two levels, namely, the pre-service and in-service levels. In many countries preservice training has not caught up with the pace of school curriculum development and has not incorporated the techniques of using new curriculum materials in their training programmes though these have been implemented at the national level. However, some teacher colleges and faculties of education have on their own initiative done so even during the experimental phase of their country's project.

Generally, training of teachers is conducted in the form of in-service training programme. In Iran, the Science Education Centre plans in-service courses for teachers with four years of teaching experience and also a four-year first degree in-service course for experienced teachers. In Pakistan, the National Educational Equipment Centre organized and conducted courses at the Federal and Provincial levels in the use and maintenance of teaching kits. A training package

in modular form had been developed in Indonesia for the in-service training of teachers to use modules in the primary and secondary schools. After the in-service training programme, evaluation questionnaires were administered by the curriculum developers and/or trainors. These feedback were usually for formative evaluation with the objective of improving the effectiveness of instructional materials. When the development of materials involved a great part of community participation like in the project of the UP Science Education Centre, informal sessions were held with classroom teachers, community and youth leaders by field investigations from time to time.

Usually the teacher training institution, the Curriculum Development Centre, and appointed education officials in the Ministry of Education with the assistance of supervisors, college lecturers, curriculum writers and key teachers have the responsibility of planning the training programme. Once the programme had been identified, the course instructors attended workshops prior to holding in-service course at national and provincial levels.

D. Problems and issues concerning the development of modules, kits and other materials

In developing modules and other materials, participating countries have experienced or anticipated problems which are either common to all or unique to one or two countries relate to teacher training and implementation of prepared materials. The specific problems and issues, on the other hand, are numerous and varied ranging from lack of research and financial support to the distribution of kits and collection of evaluation data.

The problem of training teachers for using the instructional materials mainly stems from the innovative nature of these materials and the lack of skilled personnel to train teachers. Solutions utilized or offered by all member countries, except Rep. of Korea, emphasize the importance of in-service teacher training, involvement of teachers in development processes and arrangement of special teacher workshops. The Korean Educational Development Institute proposes a unique solution which utilizes a merit system based on teacher abilities, achievement and job locations. This system has been proven effective in motivating teachers to seek training for use of materials which in turn would help them in their promotion in the merit system.

The roots of the implementation problem can be traced back to such issues as the teachers' lack of understanding of curricular materials and their continued resistance to change. Other factors responsible for implementation difficulties as submitted by member countries include heavy teaching loads, lack of peer support, administrative bureaucracy, and physical constraints.

To solve this problem, a variety of solutions have been attempted. Solutions for minimizing the resistence of teachers to change include i) modernization and broad based involvement of teachers in curriculum material development, and ii) efforts directed toward inculcating teachers awareness and appreciation of their changing role. In the pre-service and in-service training of teachers, the changing roles

of teachers are stressed. In some countries, certain mechanisms have been evolved to involve the teachers themselves in preparing plans and to act as their own agents of change (Malaysia). Some other examples of this solution include arranging effective in-service programmes and supervision as employed by Indonesia and Iran, organizing accurate time-table of work as in the community-based science education project in the Philippines, decreasing classroom size and providing continuous information to teachers as done by Korea, India, Thailand and Sri Lanka.

In addition to the problem commonly experienced by Asian countries, some specific problems and issues unique to each country were also reported. Iran, Philippines, Malaysia and Indonesia have considered different approaches for resolving the issue of integrating subject matter into one curriculum. Iran and Indonesia organized the different content areas such as physics, chemistry and biology by integrating them around general science concepts like energy or matter. In the Philippines, however, the environment is utilized as the link for interweaving different subject matters.

In case of materials like teaching kits that include some items classified as equipment, teachers and principals tend to keep the "expensive" science kit in school shelves and use them only sparingly. Since the teachers and principals would be held responsible for any loss and breakage of items in the kit, they are extremely reluctant to use these valuable kits. Solutions on a variety of levels to encourage teachers to use the science kits are being explored.

The collection of evaluation data has sometimes been a serious problems, especially in soliciting co-operation from teachers, administrators and other involved agencies. The proposed solution mainly consists of teacher involvement. In the experience of Pakistan and Iran, no steps have yet been taken to attack this problem while consideration of possible solutions continues.

E. Mechanisms and procedures for continuous evaluation

Formative evaluation is generally conducted during the developmental stage of the instructional material. The techniques of evaluation vary from country to country, depending on their educational system and cultural background. Moreover, the evaluation strategies depend mostly on the project activities. In most of the reported experiences, the feedback instrument was designed and administered by the development team. In some cases, there is an infrastructure in charge of administering the evaluation instrument and collecting of feedback.

In the experience of Thailand, Pakistan and Korea, evaluation is done at the national and/or institutional level. Indonesia employs a systematic collection of feedback through programmed instruction, test instrument and structured observations. For this purpose, special evaluation teams at national and local levels have been established. In RECSAM, the evaluation is done during the teachers' orientation workshop and classroom tryouts. However, from the evaluation results of most member countries, it appears that the person and the concerned

agency/institution involved were not given full responsibility in the evaluation procedure.

Whether the evaluation is done at the institutional or national level, generally, the teachers were involved. In Malaysia, Philippines, Indonesia and Korea, the teachers and some key leaders in the community served as the main source of information. In some cases, information was collected in the form of personnel interviews conducted by the development team and/or teachers.

Annual report is also done to serve as a progress report of the project. At times, in some countries, the progress report becomes an incidental summative evaluation.

Chapter IV

GUIDELINES FOR THE DESIGN, DEVELOPMENT AND USE OF INSTRUCTIONAL MATERIALS

The synthesis of experiences as already discussed in the preceding chapter was used as the basis for consideration of guidelines for designing, development and use of instructional materials. In their deliberations the participants divided themselves into three groups according to their areas of specialization, namely, curriculum development, teacher education and science education. The list of each group members is in Annex III. The guidelines which were developed were accompanied by checklists to ensure their feasibility and practicability. The procedures used in developing the guidelines by the different groups were more or less similar. Three steps were undertaken to prepare the guidelines: i) identifying problems relating to the areas of design, development and use of the materials; ii) considering strategies for solving the problems; and iii) developing guidelines in accordance with the selected strategies. Throughout the process of developing the guidelines, the groups took into account the problems and other relevant information as were already identified in the synthesis of experiences. The following are the results of the deliberations:

Group A. Curriculum Materials

Before identifying problems and generating strategies related to curriculum development, the group clarified the following terms: curriculum; curriculum material development, problems and strategies.

Curriculum

Curriculum is conceptualized by the group as all types of teaching-learning processes that are planned and organized to be experienced by learners to achieve defined educational objectives. Based on this understanding, curriculum development is considered as a series of consecutive activities including:

1. identification and formulation of educational objectives relevant to socio-national needs and problems;
2. structuring school learning programmes;
3. selection and organization of curriculum content;
4. selection of learning teaching strategies; and
5. development of instructional materials.

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Based on the above consideration, the Design stage of curriculum (materials) development includes activities 1 to 3. The Development Stage includes activities 4 to 5. Following the Development Stage, tested instructional materials will be ready for use.

Problems are always encountered and solved at every stage of curriculum work. In this regard, the group tried to differentiate problems from constraints. Problems are factors, forces, issues and strategies that have caused the irrelevancy, the inefficiency, and the ineffectiveness of the implementation of curriculum materials while constraints are replaceable elements of the educational system that hinder the efficient and effective implementation of curriculum materials. In this exercise the group concentrated only on identifying the basic problems underlying the activities of curriculum materials development.

The term "strategy", was conceptualized by the group as the ways, the approaches, the working mechanisms, the criteria used and the methods as well as the guidelines to develop curriculum materials that will solve the basic problems, prevent the raising of new problems, and eventually eliminate constraints.

The preceding considerations were taken into account during group discussions. The procedures used in developing the guidelines comprised the following steps:

1. identifying the basic problems related to each stage of curriculum development (including describing the nature and the scope of the problems);
2. generating strategies to solve the basic problems which include suggesting certain activities to be done, criteria to be used, working mechanisms to be set up and procedures and guidelines to be followed; and
3. divising a questionnaire to generate checklists based on the guidelines formulated.

A. Design

Problems a: Need assessment

1. Irrelevance of structuring educational programmes to national and social needs and problems.

   1.1. lack of systematic studies to identify the societal and national needs for development by which education is one of the instruments for the fulfilment of the needs;

   1.2. inability of the educational system to catch up with the changing needs of the ever-changing society.

Strategies:

1. Conduct systematic studies to identify the societal and national needs for development;

2. Identify needs and problems for survival in a changing society;

3. Develop objectives in terms of national policies, social, economic, and cultural conditions (local and national), socio-economic aspirations and socio-economic potentialities; and

4. Identify needs and problems by involving experts in the disciplines (educators, social scientists and natural scientists), to be reviewed by the teachers, administrators, official and political leaders, students and knowledgeable representatives of the community.

Guidelines:

1. Conduct direct investigation in the field or make a survey of the needs and problems;

2. Study official documents and research conducted by other people to learn about needs and problems;

3. Conduct panel discussion with experts and officials from the field; and

4. Formulate relevant problems and needs related to school educational programmes.

Questionnaire to be used in formulating a checklist

1. Has the design of the curriculum been based on the identified needs and problems of curriculum development through direct investigation in the field?

2. In identifying needs and problems what type of information has been used to generate needs and problems?

3. Has there been any panel discussion or other types of meeting with political leaders, experts in various disciplines and intellectuals, civic leaders and representatives from the community to make an assessment of needs and problems relevant to educational development and integrated rural development?

4. Has the composition of the group included experts from various disciplines (educators, social and natural scientists)?

Problems b: Generating/formulating objectives

1. Irrelevance of formulating school objectives to match with national goals, needs and problems.

   1.1. lack of proper programmes to identify educational objectives from national goals, needs and problems;

1.2. the need to relate school education programme to its functional relationships to societal and environmental development; and

1.3. the need to change the attitude which regards school as the only institution that can influence the development of total personality of the younger generation.

Strategies:

1. Develop proper procedures to identify educational objectives from national goals, needs and problems;
2. Generate and formulate educational objectives;
3. Identify the main role of the school in achieving the objectives;
4. Find out how the school can develop the capability of the student to participate actively in the community (society) in solving problems in changing society, to participate in the civic (citizenship, religious, political) life of their nation and to prepare for further learning and for total development; and
5. Involve experienced teachers, experts in content areas in formulating and generating educational objectives and selected persons from different disciplines/agencies to serve as resource persons to be reviewed by teachers, administrators, political leaders, and knowledgeable representatives of the community.

Guidelines:

1. Generate competencies, knowledge, and attitudes needed by a school graduate to be able to identify and solve problems;
2. Select competencies, knowledge and attitudes that school can accomplish; and
3. Formulate competencies in terms of educational objectives.

Questionnaire to be used in formulating a checklist

1. Has the formulation of educational objectives been based on the needs to solve problems and meet identified needs for socio-economic development, or has the formulation of the objectives been based on the needs of local community (in relation to school programmes)?
2. Has the final formulation or selection of educational objectives to be accomplished by school been based on the consideration of the capability of school programme to achieve?

Problems c: Structuring the school-learning programme

1. Ineffective and inefficient structure of the school programme for achieving educational objectives.

   1.1. reluctance among educational leaders to change the school programme to adjust to the changing needs of society due to lack of understanding of the proper role of the school in social development;

   1.2. absence of a sound and acceptable approach to develop relevant school programme for national and social development;

   1.3. lack of technique and rationale to allocate time for a certain subject; and

   1.4. lack of comprehensive and integrated approach to allocate the school learning programme according to the type of objectives to be achieved.

Strategies:

1. Structure the programme based on the following considerations: objectives of national/local education; aspirations of community members, development of the total persons (its relationsnip with the environment - human and physical); and the role and value contribution of the subject areas to the achievement of the objectives; and

2. Involve experienced competent school teachers, subject area specialists, experienced competent administrators (principals/ supervisors) and resource persons in structuring the programme, to be reviewed by experienced competent teachers, experienced competent school administrators,official and political leaders and knowledgeable representatives from the community.

Guidelines:

1. Identify subject areas as the learning objects to achieve the objectives;

2. Classify subject areas into categories of programmes relevant to the cluster of objectives;

3. Compare the value contribution in each category of each subject area to the achievement of objectives; and

4. Allocate accordingly the instructional time for each category of each subject area.

Questionnaire to be used in formulating a checklist

1. Has there been any special process conducted to formulate curriculum structure at the national and school levels in accordance with the national educational objectives and the feasibility and capability of the school?

2. Has the process of identifying subject areas or curriculum to be learned by children in the schools been based on the importance and role of a certain subject area to achieve the objectives?

3. Is the classification of subject or curriculum area into categories of educational programme (general, academic, vocational, career) relevant to the clustering of objectives?

4. Has the instructional time allocation for each subject area been based on the relative value of each subject which contributes to the achievement of the total objectives?

Problems d: Selection of content

1. Irrelevant, inefficient and ineffective selection of curriculum content responding to the achievement of educational objectives.

   1.1. the need for subject matter specialists to realize the importance of relating the content they propose to the achievement of objectives relevant to social and national development expected to be achieved by a certain subject area;

   1.2. lack of valid effective methods to select curriculum content relevant to the achievement of the objectives;

   1.3. the need for most subject matter specialists to regard the role of all potential topics as a learning object to achieve certain objectives and not to select topics influenced by his experience and preference for teaching a certain topic; and

   1.4. the absence of valid techniques that can convince subject matter specialists on how to select the content effectively.

Strategies:

1. In the selection of content, consider the role and function of a subject area in achieving the total objectives of the school;

2. Consider student's mental maturity, interest and readiness;

3. Consider the time allocation for each subject area;

4. Consider the school environment;

5. Involve in the design team selected experienced competent teachers, and selected innovative subject matter specialists; include in the review teachers who will use the materials, administrators, subject matter specialists, and knowledgeable person from different agencies;

6. International, regional, and national workshops, seminars, and training among subject matter specialist and other relevant disciplines are needed to develop effective methods to select content relevant to objectives; and

7. A special research study need to be conducted to identify the impact of inadequate content on the output of the school education.

Guidelines:

1. Identify and select objectives to be achieved in that particular subject;

2. Identify exhaustively potential topics that might be covered for certain grade levels;

3. Identify and select topics relevant to the objectives of that grade level, (availability of resources);

4. List down selected topics; and

5. Develop organization of selected topics.

Questionnaire to be used in formulating a checklist

1. Has clear objectives for each subject area been identified and selected based on the criteria specified in the guidelines to be used for the content selection?

2. Has the selection of the content been conducted after the identification of all potential topics to be learned by students in a certain grade level?

3. Has the selection of the content been based on the following criteria:

   3.1. objectives to be achieved;

   3.2. interests and intellectual maturity of the students; and

   3.3. the availability of learning resources?

Problems e: Sequencing the content

1. Ineffective and inefficient sequence of curriculum content to achieve total educational objectives.

1.1. arbitrary sequence of content without a clear functional relationships to achieve the total goal of a certain subject area as well as the total objective of the school programme;

1.2. lack of a valid approach to design the sequencing of the content in certain subject matter area to achieve the stated objective; and

1.3. inability to develop a technique/guideline on how to sequence the content in accordance with the level of intellectual maturity of the learner.

Strategies:

1. Conduct research on the impact of arbitrarily sequenced lesson on the output of school education;

2. Develop methods to sequence learning programmes effectively;

3. Consider the following in the sequencing of content:

   3.1. the role of each topic in learning the total subject area;

   3.2. prerequisite in learning the subject area for each topic;

   3.3. relevance of the nature of the topic to the level of student maturity; and

   3.4. potential effects of specific topics on the learner.

4. Involve in the design team selected experienced competent teachers, and selected innovative subject matter specialists, include in the review teachers who will use the materials, administrators, subject matter specialists and knowledgeable persons from different agencies.

Guidelines:

1. Identify functional relationship among the topics in a subject area;

2. Identify the prerequisite for learning certain topics;

3. Identify the level of difficulty of each topic in relation to the level of intellectual maturity of the student; and

4. List topics based on agreed sequence (logical, functional and effective sequence).

Questionnaire to be used in formulating a checklist

1. Has the sequence of topics for each grade level been based on the following criteria:

   1.1. logical relationship;

1.2. functional relationship;

1.3. levels of difficulty; and

1.4. prerequisite for learning topics.

(If the above criteria are not available, specify the needed criteria.)

2. Has the team to conduct the process of sequencing the content included the experienced competent teachers and innovative subject matter specialists?

B. Development

Problems a: Selecting teaching-learning strategies

1. Irrelevant teaching-learning strategies adopted to suit societal condition, teacher-competence and educational objectives.

1.1. there has been a tendency to focus solely on the interesting features of innovative ideas for educational development rather than a rationale and comprehensive consideration of these ideas relevant to solving problems originating from societal and national conditions;

1.2. it appears that introducing innovative ideas into a school system is more in the type of adopting rather than adapting;

1.3. there is a need to develop a strategy in selecting innovative ideas which will be relevant to the problems of improving teaching-learning process; and

1.4. there is a need to correct the existing tendency in adopting certain innovative ideas; without due consideration to the cultural values, availability of local and national resources, economic capability of the nation and the professional competence of the educational personnel.

Strategies

1. International, regional and national workshop, seminar and training are still needed to develop a rational way of selecting innovative ideas/methods relevant to societal conditions and needs.

2. In the selection of teaching-learning strategies the follo points should be considered:

2.1. economic potential of the nation/region and society

2.2. capability level or professional competence of the teachers;

2.3. capability of the learners;

2.4. availability of local resources (human, material, financial, natural); and

2.5. cultural values and aspirations of people in the community.

Guidelines

1. Develop teaching-learning methodologies relevant/ acceptable to the conditions stated in the strategies.

2. In line with the above statement, a country can choose the following alternatives based on the strategies enumerated previously:

2.1. traditional way of using textbooks with teacher as the centre of dissemination;

2.2. self-instruction using modules or any other materials;

2.3. use of the environment as a source of teaching-learning activities; and

2.4. use of all the teaching-learning techniques and any combination of the teaching-learning techniques mentioned.

Questionnaire to be used in formulating a checklist

1. Has the decision in adopting certain teaching-learning strategies been based on:

1.1. the quantity and the quality of the teacher available;

1.2. the type of learning objectives to be achieved;

1.3. the capability of the learner; and

1.4. the cultural value and tradition of the community?

2. Is the type of instructional materials used relevant to:

2.1. the economic capability of the society or the nation;

2.2. the level of professional competence of teachers and educational personnels;

2.3. the availability of local resources, the cultural value, and aspiration of the community; and

2.4. the capability of the learner to use the instructional materials?

Problems b: Format of the instructional materials

1. Ineffectiveness in developing format of teaching-learning materials in relation to educational objectives:

   1.1. there are still some instructional materials which were developed unsystematically which leads to ineffective learning process toward the achievement of educational objectives;

   1.2. there is a need for developing a procedure to be used as a guideline for curriculum material developers in devising instructional materials that will efficiently and effectively facilitate the learning process experienced by the learner to achieve certain objectives.

Strategies:

1. Intensive seminar, workshop and training are needed for changing techniques used to develop instructional material based on results of research studies on the impact of inadequate format on the learning process.

2. Format of development of instructional materials should fit the psychological, pedagogical principles of teaching-learning process.

Guidelines

1. The format in developing instructional materials should consider the following points/criteria:

   1.1. it should enable students to learn purposively;

   1.2. it should indicate the type of learning situations which are conducive to student's effective learning;

   1.3. it should be one of the best media leading to the achievement of specific learning objectives;

   1.4. it should motivate, inspire, excite, challenge students to learn; and

   1.5. it should specify the instructional aids needed for effective instruction.

Questionnaire to be used in formulating a checklist

1. Does the format need (use for certain instructional materials) the following criteria:

   1.1. encourage students to learn purposively;

   1.2. suit the need of certain types of learning situation;

   1.3. suit the best media to be used to achieve certain types of educational objectives;

1.4. motivate, inspire, excite and challenge the learner; and

1.5. accommodate the specification of instructional aids needed?

Problems c: Planning units of instructional material

1. Ineffective and inefficient planning units of instructional materials leading to the achievement of total learning objectives.

1.1. there is a need for teachers to correct the existing tendencies of concentrating on certain topics that suit their interest rather than giving balanced attention and time according to the value of each topic in the achievement of objectives;

1.2. there is a need to develop a procedure to programme instructional material to support the learning of a certain topic according to the function of certain topics in relation to the achievement of the objectives;

1.3. the need for teachers to use various teaching-learning strategies that is considered to be most effective to achieve certain types of objectives rather than using a single approach of teaching; and

1.4. the need for most teachers and even writers of instructional materials to give enough attention to identify necessary and important instructional aids to conduct the learning process effectively.

Strategies:

1. Apply systems approach to develop instructional materials.

2. Conduct series of workshops, seminars and other types of meeting to create direct communication between teachers, among teachers, innovative curriculum specialists and other professional educators.

3. Develop a network to exchange and disseminate innovative ideas and practices on teaching-learning strategies, and the result of research studies on instructional processes.

Guidelines:

1. Analyze the content of the curriculum for particular level and programme into functional lesson units;

2. Allocate the time for each identified lesson unit;

3. Identify learning tasks related to each lesson unit;

4. Formulate instructional objectives for each lesson unit;

5. Identify and select types of learning experiences conducive to achieving the instructional objectives for each lesson unit; and

6. Identify instructional aids that will facilitate the conduct of instructional process.

Questionnaire to be used in formulating a checklist:

1. Is the function of a unit of instructional materials clearly related to the achievement of a total learning objective?

2. Has the allocation of instructional time for a certain instructional unit been based on the value contribution and role of a certain lesson unit?

3. Has the instructional materials unit clarified instructional objectives to be achieved?

4. Are the type and number of learning experiences in a certain instructional unit conducive to the achievement of the instructional objectives of the lesson unit?

5. Are there specified instructional aids needed to facilitate the conduct of instructional process of a certain lesson unit?

6. Are the identified instructional units relevant to the environmental condition, resources available and the type of objectives to be achieved?

Problems d: Writing instructional materials

1. Inefficient and ineffective way of writing instructional materials leading to the achievement of educational objectives.

   1.1. the need to change the existing trend in writing instructional materials using the story-telling type to support the conduct of the learning process;

   1.2. the need to develop various educational media suitable to the condition, objectives and types of teaching-learning process and the types of objectives to be learned.

Strategies:

1. A special programme needs to be developed to create the capabilities to write and produce varied instructional materials.

2. There are varieties of teaching instructional materials:

   2.1. the learning manuals i.e. textbooks, self-learning materials, pamphlets, exercise sheets, and supplementary readings;

2.2. teaching manuals like teachers' guides; and instructional aids like manuals on how to develop, select, use and maintain the instructional aids; and

2.3. enrichment remedial compensatory, supplementary materials for teachers and students i.e. written materials and manuals on how to select, what to develop, how to use materials based on effectiveness and efficiency.

Guidelines:

1. Identify learning media that suit the type of learning process to be experienced by the student to achieve instructional objectives;

2. Identify stages of learning processes that lead learners to achieve certain instructional objectives;

3. Develop format that will accommodate the type of learning media and stages of the learning process identified above; and

4. Write and/or develop the learning media.

Questionnaire to be used in formulating a checklist

1. Are the learning media developed or written relevant to the type of instruction processes to achieve the objectives?

2. Do the instructional media/written/or produced indicate stages of instruction processes that will lead learners to achieve instructional objectives?

Problems e: Try-out and Evaluation

1. The lack or inadequacy of trying out curriculum materials due to the constraints of time, budget and technical know-how.

1.1. there have been many failures of adapting certain instructional materials because in most countries the products of curriculum development are immediately implemented without being put into trial to find out level of its effectiveness and efficiency as well as the conditions and professional competencies needed to support the use of the instructional materials; and

1.2. there is a need to suggest the importance of utilizing formative and summative evaluation in assessing the new instructional materials produced in the trial stage before disseminating it in larger scale.

Strategies

1. There are many ways to find out the effectiveness and efficiency of certain try-out materials and the condition to implement it.

   1.1. long-term trials using pilot approach;

   1.2. short-term trials using ordinary schools; and

   1.3. intensive training workshop for the teachers and other educational personnel.

2. In determining which of the alternatives is suitable for a certain condition and countries, the following criteria need to be considered:

   2.1. the nature and scope of innovative ideas in the instructional materials; and

   2.2. the urgency of using the instructional materials.

3. Series of workshops and training using results of research studies are needed to develop the awareness and the capability of educational personnel to conduct pilot study.

4. The importance of the try-out of instructional materials developed are as follows:

   4.1. to find out the level of efficiency of the materials and effectiveness as looked upon from their impact on the learner;

   4.2. to know the requirements for the instructional materials on the part of teacher competence;

   4.3. to identify the conditions relevant to the use of the materials developed; and

   4.4. to identify facilities needed to support the implementation of the materials.

Guidelines

1. Select the school representing the natural setting;

2. Organize evaluation team to develop evaluation instruments;

3. Organize a team to operate the try-out continuously and to collect the feedback objectively;

4. Organize a team to analyze and to interpret the feedback on the efficiency, effectiveness and condition of using and adapting the instructional materials.

   This team should work co-operatively with the team in charge of feedback collection; and

5. Prepare evaluation reports functional to the writers as a basis for revision.

Questionnaire to be used in formulating a checklist

1. Have the instructional materials been put in trial schools before revision?

2. If yes, are the trial schools represented in the natural setting?

Problems f: Revision

1. The lack of systematic or collective consideration to revise curriculum materials.

   1.1. there is a tendency to base merely the revision of instructional materials on either subjective expert judgement or structure-collected information based on certain evaluation programme that will produce one-sidedness of revision;

   1.2. there is a need to suggest the importance of using both information based on longer trial period; and

   1.3. formative and summative evaluation should be administered to assure efficient revision.

Strategies

1. Invite or solicit participation in material production from personnel involved as early as possible, and keep them informed and get their participation in every developmental stage.

2. Conduct research on the importance of formative evaluation and inform every participant the up-to-date progress on the utilization of the data, and invite them for comments and suggestions for continuous improvement.

3. Encourage individual person/institute/institution to try-out innovation on independent and/or common project with a view to fostering constructive revision of the materials or method of operation.

Guidelines

1. Collect feedback by evaluation team and participant observers;

2. Identify teacher comments and suggestions based on their experiences in using the materials; and

3. Use writer's own judgement based on direct observation.

Questionnaire to be used in formulating a checklist

1. What type of information collected from trial stage would be used as the basis for revision?

2. Have the working mechanisms been established to correct information from the field?

3. Have teachers' comments been included for the revision of the instructional materials?

Problems g: Printing and production

1. Inefficient co-ordination and supervision of producing curriculum materials relevant to educational objectives including quality control of material production.

   1.1. there is a need to influence the printer and producer of instructional materials to consider the importance of producing and printing instructional material that will satisfy the educational need of the learners;

   1.2. there is a need to develop a criteria in producing instructional materials that will satisfy the educational needs of the learners;

   1.3. there is a tendency that economic factor has hindered the proper uses of instructional materials; and

   1.4. there is a need to develop instructional materials that can be supported by the educational system.

Strategies

1. Conduct research on evaluation of materials and send the information to printer/producer with the request for effective revision;

2. Propose to the producer or printer the more efficient criteria and production process so that improvement can be made by producer/printer; and

3. Conduct intensive training seminar to study critically the weaknesses, strengths, suggestions and recommendations for improving the production process.

Guidelines

1. Clear and attractive - each instructional material should clearly illustrate the message to be learned or to be followed;

2. Economical - in selecting the type of material to be produced, the cost should be considered whether it can be supported by the system or not in terms of time, efforts and money;

3. Durable - usability in terms of time;

4. Efficient - able to achieve more than one objective if possible;

5. Appropriate - adequate for the learner to achieve the objective; and

6. Easy to use - simple, easy to handle and manipulate.

Questionnaire to be used in formulating a checklist

1. Are the developed instructional materials clear in presenting the message and attractive to the learners?

2. Is the type of material used being looked upon from the financial capability of the society or the nation where the school is operating?

3. Will the instructional material last for a longer time (durability)?

4. Does the instructional material become the most effective means for the learner to achieve the instructional objectives?

5. Is the instructional material simple enough to be used, handled, and manipulated by both learners and teachers?

C. Use

Problems a: Implementation

1. The lack of preparation of teacher and other educational personnel to be ready for effective implementation of new curriculum materials and instructional aids.

   1.1. in many countries there has not been enough preparations to support the use and implementation of instructional materials efficiently and effectively, and

   1.2. there should be a well prepared programme to create readiness of the personnel and schools to use the instructional materials efficiently and effectively.

Strategies

1. Develop the national implementation plan for the use of the materials produced;

2. Appoint committee/working group to be in charge of policy making/decision making and supervising the use of materials in accordance with the national implementation plan;

3. Establish administrative mechanism to be responsible for the organization, service, supervision, evaluation, record and report of the progress of the national implementation plan;

4. Develop public relation system to inform about important events by responsible educational personnel so that those who are concerned will be aware of their responsibilities and tasks; and

5. Develop public relation system by disseminating simple information to people in order to solicit widest possible public support.

Guidelines

1. To ensure efficiency and effectiveness of using the materials, the following criteria should be considered:

   1.1. materials should be available or ready in time;

   1.2. teachers should be ready to use the materials;

   1.3. administrators should be ready to manage and monitor the use of materials;

   1.4. supervisors should be ready to supervise and help teachers; and

   1.5. maintenance of materials should be properly done.

2. To ensure readiness, the following activities should be undertaken:

   2.1. develop proper management of distribution and delivery system;

   2.2. develop teacher training programmes and administer in-service training programmes for teachers;

   2.3. develop in-service training programmes for administrators;

   2.4. develop a supervisory system;

2.5. develop a guidebook on how to maintain and use instructional materials; and

2.6. develop in-service training programmes for selected teachers/technicians for maintenance and operation of instructional materials.

Questionnaire to be used in formulating a checklist

1. Has the materials been available or ready for use in time in every school?

2. Are the teachers capable of using instructional materials effectively and efficiently?

3. Are the administrators ready and capable of managing and monitoring the use of instructional materials?

4. Are the supervisors capable of supervising and giving professional help to teachers in using instructional materials?

5. Has the maintenance service been developed to repair and maintain the instructional materials?

Group B. Teacher education materials

A very important task connected with programmes of integrated rural development requires proper materials to be developed for teacher education. In this section an attempt is made to develop guidelines that could provide a frame of reference for developing teacher education materials according to the local requirements and resources. Mention has also been made for evolving appropriate procedures of evaluation to assess the efficiency of teacher education materials on a continuous and comprehensive basis.

The group involved with the task of formulating guidelines for the design, development and use of instructional materials for teacher education identified problems in each category in order to propose strategies leading to the development of guidelines. Checklists were then prepared to test and review the guidelines against some examplar instructional materials.

The common materials used in teacher education were identified to be the following: i) locally available resource materials; ii) textbooks; iii) teachers' guides; iv) student guides; v) correspondence materials; vi) modular instructional materials; and vi) teaching and self-instructional kits.

The problems related to design, development and use of the instructional materials for teacher education have been examined in terms of the following criteria in order to project a totality of structure of each category: i) applicability; ii) innovativeness; iii) comprehensiveness; iv) cost effectiveness; v) availability; vi) adaptability; vii) accessibility; viii) relevance to national development; ix) diffusibility; x) acceptability; xi) stimulating creativity; and xii) effectiveness.

A. Design

Problems:

1. There is absence of linkage to national development. Lack of support from the government and other agencies is responsible, to some extent, for passive participation of teachers in programmes related to community development;

2. There is lack of a totality of the programme, particularly its linkage to other sectors of community involved in rural development;

3. Certain designs do not take into account the adoption of new programmes and new methodologies of teacher education; and

4. Some existing materials are not employable in a given learning situation.

Strategies:

1. Innovative programmes based on emerging needs and national development goals should be considered in the design;

2. Possibility of organization of national workshops related to the correlatedness of the problem, comprehensiveness of objectives and linkage to community;

3. Emphasizing integrated planning, execution and evaluation at micro and macro levels. Relevant government departments and voluntary agencies to be involved in workshops and their resources made use of in teacher education;

4. Identification of projects related to the new programmes and new methods of teacher education and also case studies of some projects and provision of opportunity to the project director and the staff to exchange their experiences with other key educators in the country, in national level workshops;

5. Compilation of case studies on new programmes and new methods of teacher education and exchange of information on such studies within the country, and subsequent distribution of such materials to institutions involved in designing such programmes;

6. Organization of workshops and seminars directed to the utilization of the existing materials and for promotion of understanding the strategies of designing instructional materials; and

7. Organization of workshops and in-service education programmes in curriculum design, involving teachers, for maximum use of existing material including modification of usable materials.

Guidelines:

1. Design should ensure that it becomes possible to adopt new programmes and methodologies of teacher education;

2. Design should provide for exchange of ideas and information amongst educators involved in projects and case studies related to new programmes and methods of teacher educatior;

3. Design should incorporate into it all the elements of integrated planning, execution and evaluation at both macro and micro levels; and

4. Design should ensure that the material to be developed is applicable to a particular learning situation in a teacher education programme.

B. Development

Problems:

1. Inability to develop and apply new techniques to teacher education programmes;

2. Inability to integrate various components in the total context of the objectives of the teacher education programme in rural development;

3. There has been a difficulty of identifying the core elements of a curriculum for rural development and to translate them for producing teaching-learning materials;

4. Materials developed often stifle or cripple the creativity of the student teacher;

5. Low cost instructional materials that have some effectiveness are not chosen;

6. Lack of knowledge and skill to choose the appropriate type of instructional materials suitable to learning situations;

7. Inability to identify and modify raw materials to make instructional materials;

8. Inaccessibility to information and raw materials needed to develop instructional materials; and

9. Inability to identify accessible materials for the learner.

Strategies:

1. Development of core curricula based on the educational goals, aims and objectives of teacher education and role of teacher education in rural development by multi-disciplinary study group.

2. Development of skills leading to persuasion for a change to utilize new techniques through orientation to some new techniques to be used in teacher education;

3. Establishing necessary integration through involvement of various types of agencies (government, private, voluntary) in curriculum development, with the teacher acting as a communicator, promotor and co-ordinator between school and community;

4. Effective coverage of all components involving consideration of the total person in teacher education programme;

5. Co-operative planning of teacher education programme with concerned educational personnel and with other agencies in the rural development;

6. Extension services of teacher education institutions rendered to schools and communities, contributing to rural development;

7. Merging of some education courses with related and concerned subjects to integrate theory with practice;

8. Identification of core elements of curriculum for rural development through field surveys;

9. Arrangements of workshops and seminars to develop materials based on rural development;

10. Provision of opportunity to teachers for clinical experiences in the field;

11. Provision of opportunity to teachers to get experiences in writing materials;

12. Preparing inventory of low cost instructional materials to be included in the curriculum;

13. Organization of practical training programmes on how to choose and use low cost instructional materials; and

14. Setting up of some communication channels among the peer teachers for selecting the appropriate type of instructional materials, emphasizing team work to share the experiences.

Guidelines:

1. Development of core curricula should be based on the educational goals, aims and objectives of teacher education programme and the role of teacher education in rural development, to be formulated in a multi-disciplinary study group.

2. Development should ensure participation of all types of agencies involved in rural development;

3. Development should ensure that translation of the curriculum into teaching learning materials is based on core elements identified through field surveys and studies;

4. Development should provide for opportunities of acquiring clinical experiences and skills in writing instructional materials; and

5. Development should take into accpunt inclusion of inventory of low cost instructional materials and their use in the curriculum, organization of training programmes on selection and use as well as on new techniques in teacher education.

C. Use

Problems:

1. Distribution and supply of instructional material;

2. Quality of the environment of the home and the school leading to incompatible situations in learning;

3. The material is not useful in a given learning situation;

4. Lack of proper attitude, knowledge and skill to use the material;

5. The material needed in a given teaching-learning situation is not available;

6. The material is not related to the objectives to be achieved in a given situation;

7. The material cannot be modified for use in related situations; and

8. Lack of appropriate tools to evaluate the material.

Strategies:

1. Development of distance learning system to ensure wider distribution and supply and use of the material;

2. Establishment of material dissemination centres;

3. Development of mobile cases containing instructional materials;

4. Designing of curriculum relevant to needs of the community;

5. Developing schools as centres of community and vice-versa;

6. Organization of workshops, seminars oriented towards aims and objectives of the programme;

7. Designing a mechanism for developing low-cost instructional materials;

8. Designing of appropriate tools for evaluating the given material; and

9. Modification of the material to include examples from a wide range of experiences.

Guidelines:

The following guidelines are suggested for the use of teacher education materials:

1. Effective and wider use of the material should be ensured through all possible learning/distribution and supply system, e.g. correspondence system, mobile book case, etc.;

2. The school should act as the centre of development of all activities of the community;

3. For effective dissemination of materials, it would be desirable to provide opportunities to the learner to participate in workshops and seminars oriented towards aims and objectives of the programme;

4. Mechanism should be evolved to involve appropriate agencies in bringing out low-cost materials;

5. Attempts should be made to devise various types of tools suitable for evaluation of materials.

Evolving a checklist to check designing, development and use of materials in the area of teacher education

The Group examined 16 instructional materials by using a checklist developed on the basis of guidelines. The 16 instructional materials examined were as follows:

1. Teaching social studies at secondary schools (Nepal);

2. Content-cum-methodology and enrichment courses for secondary school teachers in mathematics, physics and chemistry (India);

3. Resource units in various areas of physics for secondary school teachers (India);

4. Correspondence teaching material for teaching of English at secondary school (India);

5. Areas of village survey (Sri Lanka);

6. Community education syllabus (Sri Lanka);

7. A module on the development of employable skills (Rep. of Korea);

8. A module on fundamental agriculture (vegetable gardening) (Philippines);

9. Fundamental arts and crafts - common handtools in handicrafts: their uses and care (Philippines);

10. Modules on the role of teacher as change agent (Indonesia);

11. The role of the teacher as change agent (Nepal);

12. The development of skills in conducting surveys to identify health needs and problems in rural communities (Philippines);

13. The concept of rural community development (Thailand);

14. The rural school as a social organization and as a community centre (Pakistan);

15. Methods of teaching involving group processes (India); and

16. Module on educational innovation for development (Philippines).

The material used in teacher education were mostly identified as:

1. Modular instructional material;

2. Correspondence material; and/or

3. Printed materials.

It was found that most of materials examined reflect goals of national development with special emphasis on integrated rural development while four materials focus on subject teaching in general; four materials are developed for school children, while 12 materials are designed for student-teachers and in-service teachers. All of them except two are designed for the purpose of training the teacher and teacher educators. One module examined is also useful in training of teachers for vocational education.

These materials were examined in accordance with the checklist developed. This necessitated a few modifications in the checklist, the revised version of which is given below.

Checklist

The following checklist is made to evaluate the design, development and use of the materials for teacher education.

I. Design	Yes	No
1. What is the material used in teacher education?		
a) local resource material	___	___
b) printed material	___	___
c) modular instructional material	___	___
d) teaching and self-instructional kits	___	___
e) others ___ (specify) _____	___	___
2. Does the material reflect?		
a) the needs of the learners	___	___
b) the needs of rural community	___	___
c) the goals of national development	___	___
d) others ___ (specify) _____	___	___
3. Is the material focused on?		
a) integrated rural development	___	___
b) health and nutrition	___	___
c) productive skills	___	___
d) universalization of educational opportunities	___	___
e) national integration and international understanding	___	___
4. Is the material designed to stimulate?		
a) innovation in teacher education	___	___
b) resourcefulness in teacher education	___	___
c) self-renewal in teacher education	___	___
5. Is the material designed to promote skills to utilize?		
a) human resources for teaching	___	___
b) local resource materials for teaching	___	___
c) other low cost materials for teaching	___	___

II. Development

	Yes	No
A. Objectives		
1. Do objectives reflect?		
a) learning needs	___	___
b) needs of society (citizenship)	___	___
c) developmental needs (socio-economic)	___	___
d) demands of subjects or disciplines	___	___
e) needs of the learners	___	___
f) others ____ (specify) _____	___	___
2. Do objectives focus on?		
a) cognitive behaviour	___	___
b) affective behaviour	___	___
c) psychomotor behaviour	___	___
3. Are objectives stated in?		
a) descriptive terms	___	___
b) behavioural terms	___	___
B. Selection of the material		
1. Does the material developed belong to?		
a) low cost material	___	___
b) textbook	___	___
c) teachers guide	___	___
d) correspondence material	___	___
e) modular instructional material	___	___
f) teaching and self learning kits	___	___
g) others ____ (specify) _____	___	___
2. Is the material developed directed to?		
a) children in the classroom	___	___
b) student teachers	___	___
c) teachers	___	___
d) teacher educators	___	___
e) others ____ (specify) _____	___	___
3. Is the material accessible to the teachers and the students?		
a) easily	___	___

	Yes	No
b) occasionally	___	___
c) rarely	___	___

C. Organization of the material

1. Is the material oriented toward?

a) content	___	___
b) action	___	___

2. Is the material organized to stimulate?

a) creativity of the learner	___	___
b) resourcefulness of the learner	___	___
c) self-renewal of the learner	___	___

3. Is the material organized to provide for interaction between:

a) the learner and the peers	___	___
b) the learner and the teacher	___	___
c) the learner and the community	___	___

D. Methodology

1. Does it promote maximum use of available resources by the learner?

a) at home	___	___
b) in school	___	___
c) in the community	___	___

2. Does it promote linkage between in-school learning activities and out-of-school experiences? ___ ___

3. Does it encourage the learner to participate in community development activity? ___ ___

4. Are learning activities contained in the material varied and flexible enough to meet individual differences? ___ ___

III. Use

1. Does the way of overcoming problems of distribution and supply of the materials involve use of?

a) distance learning	___	___
b) correspondence education	___	___
c) mobile book cases	___	___
d) other ____ (specify) ____	___	___

	Yes	No
2. Are difficulties in supplies and distribution of the materials related to?		
a) volume	—	—
b) cost	—	—
c) continuity of distribution and supply	—	—
3. Does the evaluation procedure contained in the material provide for divergent responses of the learner?	—	—
4. Is the tryout and refinement of material made periodically?	—	—

Group C. Science Education Materials

Science education materials sometimes have the advantage of do-it-yourself approach to learning and they may bring into the classroom more effective teaching strategies. The co-operative efforts among school administrators, supervisors, teachers, students parents and the community in the development of educational materials could provide breakthroughs in the attempt to solve problems of providing maximum use of local resources for children. An effective design for developing educational materials should consider the improvement of instructions to bring about better quality of education for children. It should employ the best possible strategy to utilize available materials and human resources to solve the problems of instruction and to meet the desired needs and objectives of children in congruence with the national objectives.

The group felt that all of the following items: (a) methods and criteria for rural development; (b) strategies, methodologies and institutional arrangements for the development of instructional skills; (c) training of teachers; (d) problems, issues and strategies to solve them and (e) evaluation, have special significance to the design, development, and use of science instructional materials. In fact item (d) would be included in all the components mentioned under (a), (b), (c) and (e).

The group's effort was to prepare guidelines for design, development and use of science education materials on the basis of the synthesis of the experiences of participants regarding three important components, namely, local resources, printed materials and other materials.

I. Design

It includes preparation of a blue print for the development, use and further improvement of the programme, rationale for development, selection of personnel, time budget, allotment of funds and allocation of administrative responsibilities.

Problems:

1. Adhocism in planning;
2. Improper use of the materials;
3. Unrealistic and unimplementable curriculum due to unscientific design and lack of research base;
4. Communication difficulty arising during the development and use of the materials due to improper selection of personnel;
5. Out dated curriculum with lop sided bias on elements not relevant to learner;
6. Frequent duplication of topics in different subjects studied by the students;
7. Difficulty during development and use due to the rigid and biased attitude adopted by the designing team;
8. Irrepairable damage may be detected during summative evaluation; and
9. Prevention of growth of academic character of the materials due to administrative intricacies.

Strategies

1. Applying method of total planning;
2. Linking design with research findings and other national and international experiences;
3. Involvement of people of right calibre with proper orientation;
4. Incorporation of new trends of science education;
5. Integration with other subjects;
6. Sequential links between different levels of education;
7. Selection of proper instructional strategies;
8. Applying built-in monitoring system at every stage of instructional development; and
9. Conferring specific responsibilities commensurate with adequate authority.

Guidelines:

1. There should be a design for a total development of the followings: materials, instructional skills, dissemination strategies, teacher training programmes and evaluation and revision procedures;

2. Stress should be laid on research findings as essential pre-requisite to the design and development. Available research findings are required on learning abilities of the child, teacher competencies, socio-economic factors and local resources;

3. The selection of appropriate personnel in the development and also the orientation of such personnel should be ensured;

4. The design should ensure the possibility of considering new trends of science education;

5. The design should provide scope for integrating science with other subjects;

6. Linkage to different levels of education should be adequately ensured;

7. The design should be sufficiently flexible to permit necessary modifications at the different stages of development and use;

8. The design should have a built-in monitoring system to check at every stage of work and to make necessary modifications; and

9. The design should fix responsibilities and each responsibility should be accompanied with power to enable successful development and implementation.

II. Development

It includes identification of educational goals, selection of objectives, preparation of syllabuses, spelling out of syllabuses, preparation of manuscripts, development of kit items, other teaching aids, evaluation tools, arrangements of field tryouts, finalization of manuscripts, development of materials for orientation and training programmes.

Problems:

1. The development of materials often has no link with the national goals;

2. The materials developed, usually become theoretical and appear more for the use of teachers than for the learning of students;

3. The development of curriculum often produces materials which could not be implemented;

4. Too much bias on cognitive domain objectives is seen in the science curriculum;

5. The presence of deadwood and backdated information in the science material often prevents the inclusion of useful components;

6. The development of a subjective instructional material occurs, where it is not based on well selected objectives;

7. Lack of synchronization in the development of various types of materials occurs because development is often not planned simultaneously;

8. A number of weaknesses remains in the first draft of materials; and

9. The implementation of the programmes without incorporation of tryout data creates a number of problems which become difficult to rectify.

Strategies:

1. Linking the goals of science education with the national goals;

2. Attainment of the qualities of life through the incorporation of the relevant elements;

3. Identification of factors which affect the diffusion of knowledge;

4. Follow systematic steps for the proper selection of objectives;

5. Application of systems approach;

6. Selecting and sequencing the topics in line with specific objectives;

7. Review and consider objectives before the manuscript is laid out;

8. Develop prototypes of kits along with the prototypes of materials;

9. Conduct tryouts in selected classrooms;

10. Revision of materials based on the experiences of tryouts; and

11. Make necessary arrangements for the training of personnel and for the collection of data.

Guidelines:

1. The goals of national development which are to be linked with the goals of science education should be clearly identified;

2. The qualities of life to be attained through science education need to be determined;

3. The learning ability of the child, availability of resources, the teacher competency and teaching strategies should be identified;

4. The objectives should be selected on the basis of the above mentioned identifications;

5. Use of systems approach in the development of materials should be followed;

6. The syllabus should be developed by selecting and sequencing content which will meet the objectives;

7. The first draft of the manuscript should be written on the basis of the stated objectives;

8. The prototype of kit items and other aids should be developed simultaneously with the development of textual materials;

9. The try-out should be arranged and necessary steps for the orientation of teachers, and for the collection of data should be undertaken; and

10. Try-out experiences should be used for editing the manuscripts and for revising the kits and other aids.

III. Uses

It includes advance preparation, sequencing, testing, maintenance and improvement of the materials.

Problems:

1. The use of contrived situation in the science activity gives an impression to the student that science is present only in the laboratory;

2. There are difficulties in locating suitable resources to make science education socially relevant and at the same time pedagogically sound;

3. During the teaching of science, teacher often meets unprecedented situations such as safety problem;

4. A number of factors prevent the teaching from being meaningful and the presentation becomes incoherent;

5. Children do not learn in the same way which makes effective teaching difficult;

6. Lack of materials of different kinds other than textbooks, demands more imagination from the teacher to reinforce the learning; and

7. The wastage of resources has added to the problem of limited resources.

Strategies:

1. Collection and identification of resources including local ones;

2. Systematic programmes of training;

3. Proper arrangement of classrooms and laboratories with due attention to safety precautions;

4. Dispensing according to specific needs and local conditions;

5. Consideration of individual abilities and attitudes by teacher for effective learning of the students;

6. Appropriate actions for the follow-up activities;

7. Proper measures to be adopted by the teachers and other functionaries to meet the requirements of the target groups;

8. Standardized tests, teacher made tests and other measuring tools to be given to students for the evaluation of learning outcomes; and

9. Proformas and questionnaires for monitoring day to day record and collected data used for the further improvement of the curriculum.

Guidelines:

1. Identification and collection of all the resources including the local resources are required for teaching;

2. The programmes of training should be planned in a systematic manner in co-ordination with the supply of other components such as kits, etc.;

3. Proper organization and management of the classroom/ laboratory should be done for facilitating teaching-learning interactions, precautions and safety;

4. The appropriate sequencing of topics should be planned for teaching-learning according to specific needs;

5. Different situations for learning experience should be thoughtfully provided as far as possible according to the needs of the individual child;

6. Necessary follow-up actions should be provided after each class;

7. Necessary steps should be taken for maintenance and care of materials after use;

8. Arrangements should be preplanned for the use of tests in judging the effectiveness of lesson objectives; and

9. A day-to-day record on problems encountered and experiences gained for further improvements is necessary to maintain.

Checklist

The following checklist is made to evaluate the design, development and use of the materials for science education.

I. Design	Yes	No
1. Does the plan include simultaneous development of the following?		
a) syllabus	___	___
b) guides	___	___
c) textbooks	___	___
d) work books	___	___
e) laboratory manuals	___	___
f) teachers' guides	___	___
g) materials for training programmes	___	___
h) kits	___	___
i) kit guides	___	___
j) charts	___	___
k) modules	___	___
l) models	___	___
m) slides	___	___
n) filmstrips	___	___
o) films	___	___
2. Does the plan include evaluation and revision of the following?		
a) development of materials	___	___
b) development of instructional skills	___	___
c) dissemination of materials	___	___

	Yes	No
d) training of teachers	___	___
3. Is the plan based on research findings of the following areas?		
a) learning abilities of the target group	___	___
b) resource availability	___	___
c) teacher competencies	___	___
d) use of local resources	___	___
4. Does the plan take into consideration research findings of the following?		
a) own country	___	___
b) other countries	___	___
5. Does the working group for development include following categories of people?		
a) subject experts	___	___
b) teacher educators	___	___
c) science educators	___	___
d) educational administrators	___	___
e) classroom teachers	___	___
f) representatives of teachers' associations	___	___
g) learners	___	___
h) community leaders	___	___
i) educational psychologists	___	___
j) educational technologists	___	___
6. Do members of the group have experience of the assigned task?	___	___
7. Were members of the working group oriented before the commencement of the work?	___	___
8. Does the design ensure the adoption of the following new trends of science education?		
a) development of science processes	___	___
b) linking with objectives of national goal	___	___
c) use of local resources	___	___
d) cultural and social relevance of science education	___	___
e) individualized instruction	___	___
f) learning ability	___	___

	Yes	No
9. Does the design ensure integration of science subjects with the following?		
a) different disciplines of science	___	___
b) other disciplines	___	___
10. Is the sequential linkage ensured at the following levels?		
a) pre-school	___	___
b) primary	___	___
c) secondary	___	___
d) higher education	___	___
11. Does the recommended instructional strategies include the following alternatives?		
a) lecturing	___	___
b) discussion	___	___
c) group learning	___	___
d) individual learning	___	___
e) self-paced	___	___
f) fixed-paced	___	___
12. Was the content organized in a way that included the following?		
a) remedial units	___	___
b) optional units	___	___
c) core elements	___	___
d) enrichment units	___	___
13. Does the design include monitoring system to check the following?		
a) specific objectives	___	___
b) time schedules	___	___
c) financial resources	___	___
d) training of personnel	___	___
e) local resources	___	___
f) physical facilities	___	___
14. Does the design ensure provisions for modifications in terms of the following?		
a) evaluation	___	___
b) strategies	___	___
c) implementation	___	___

	Yes	No
15. Does the design provide adequate authority commensurate with responsibility assigned to the different functionaries?	___	___

II. Development

1. Does the development of the material incorporate the following national goals?		
a) national integration	___	___
b) increase in productivity	___	___
c) expansion of education, health and nutrition	___	___
d) improvement of environment	___	___
e) rural development	___	___
2. Is the development of the material based on the development of the following qualities of life?		
a) dignity of work	___	___
b) creative thinking	___	___
c) self-reliance	___	___
d) decision on the basis of collected evidences	___	___
e) tolerance	___	___
f) social and environmental responsibilities	___	___
g) courage to ask questions	___	___
h) aesthetic sense	___	___
i) inquiring mind	___	___
3. Is the development of materials based on the following considerations?		
a) availability of resources	___	___
b) learning abilities of the child	___	___
c) teacher competencies	___	___
4. Were the selected objectives based on the identification of the following?		
a) goals of national development	___	___
b) goals of science education	___	___
c) attainment of qualities of life	___	___
d) learning abilities of the child	___	___
e) teacher competencies	___	___
5. Is the selection of content done on the basis of selected objectives?	___	___

	Yes	No
6. Is the first draft written to meet the selected objectives?	___	___
7. Are the prototype of the kit items and other aids developed simultaneously with the development of textual materials?	___	___
8. Are the materials tried out and data collected?	___	___
9. Are the following steps taken/initiated for the training of teachers and other personnel?		
a) development of materials for different training programmes	___	___
b) organization of orientation workshops	___	___
c) training of resource persons for writing materials and organizing workshops	___	___
10. Are the try-out experiences incorporated in editing the manuscript and other materials?	___	___
11. Are the key personnel trained in the use of the materials developed?	___	___

III. Use

1. Have collection and identification of the following been made?		
a) items of the kit	___	___
b) local resources	___	___
c) laboratory equipment including apparatus, specimens, etc.	___	___
d) audio-visual aids including apparatus, charts, models, pictures, etc.	___	___
2. Have the following steps been undertaken before using materials?		
a) consideration of broad framework of training different personnel	___	___
b) organizing training programmes in a systematic way	___	___
c) co-ordinating training programmes with other components such as kits, written materials, etc.	___	___
3. Have the following been considered while organizing the laboratory?		
a) advanced preparation	___	___
b) precautions	___	___

	Yes	No
c) safety	___	___
4. Are the specific needs considered for sequencing the topics?	___	___
5. Are the provisions made for meeting the requirements of individualized learning?	___	___
6. Are the steps taken for getting the feedback for immediate improvement of teaching and for development of materials on the following?		
a) teacher training	___	___
b) training of the personnel	___	___
c) use of instructional aids	___	___
d) use of kits and laboratory equipment	___	___
e) use of printed materials	___	___
7. Have the appropriate steps been taken for maintenance and care of different materials after use?	___	___
8. Are the steps taken for the use of the following types of measurements?		
a) achievement measures	___	___
b) interest inventories	___	___
c) attitude measures	___	___
d) psychomotor measures	___	___
9. Are the steps taken to collect day-to-day information on the following?		
a) difficulties in the use of laboratory equipment	___	___
b) problems in the use of kits	___	___
c) teaching strategies	___	___
d) teaching aids	___	___

Chapter V

CONCLUSION

The highlights of experiences of the participants in developing instructional materials are related to curriculum development, teacher education and science education and have been presented in terms of a) local and community resources; b) printed materials, to implement the core curriculum; and c) other materials, which may serve for enrichment and other purposes.

The deliberations of the Group touched upon the following aspects:

1. Alternative approaches to identification of needs and resources as a basis for curriculum development;

2. Strategies and methodologies adopted in translating the curriculum into teaching learning materials and learning aids;

3. Training of teachers and other educational personnel;

4. Problems and issues involved in the development of instructional materials and their attempted solutions; and

5. Mechanism of evaluation and renewal of materials and programmes.

In designing strategies for translating the curriculum to teaching learning situation, the following points emerged:

1. Necessity of exposure of teachers to rural areas;

2. Conducting orientation meetings for school administrators and concerned agencies; and

3. Soliciting co-operation of postal services for distance learning.

The problems encountered in the development and use of instructional materials and training procedures are summed up as follows:

1. Data collection (antogonism and suspicion of pressure groups);

2. Role perception of teachers and community;

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3. Use of instructional materials (distribution mechanism);
4. Lack of trained personnel;
5. Preparation of teachers and community workers;
6. Translation of the core curriculum into instructional materials (lack of congruence of school objectives and operations to community development);
7. Design and administration of teacher education programmes;
8. Integration of disciplines to achieve totality of purpose;
9. Lack of support from administration; and
10. Financial constraints.

Methods employed for evaluating developed materials include: a) testing and try-out in the classrooms; b) teacher workshops; and c) feedback collection through questionnaires.

Activities at the community level can be evaluated using the instruments like:

1. Checklists
2. Inventory of achievements
3. Supervisor's evaluation
4. Peer evaluation
5. Regular visits of administrators
6. Opinion of community members through interviews and questionnaires
7. Action research studies
8. Reports and conferences.

Based on the problems revealed through the synthesis of experiences, the Study Group was involved with the task of formulating guidelines for the design, development and use of instructional materials for curriculum development, teacher education and science education. Checklists were then prepared to test and review the guidelines by applying them to some exemplar materials.

The experiences presented at the meeting are indicative of a variety of approaches being used for development and renewal of instructional materials. There is an obvious trend to ensure broad-based involvement in this exercise, with emphases on community participation and leadership, inter-agency and interdisciplinary co-operation add the use of environment as a resource for learning. Another prominent trend is the incorporation in the project design, built-in mechanisms of continual assessment and reconstruction. Still another promising new direction is the combining of the traditional learning resources with the more sophisticated, newer ones, such as

in developing teaching and organizing strategies; and rooting innovations in cultural norms, particularly the prevalent modes of communication, and cognitive styles of the communities and the children to be served. Finally, field studies and a variety of evaluative techniques are being used - both directed to 'improving' the projects and their elements, rather than being over-occupied with 'providing' their effectiveness. More and more, the knowledge creation, the knowledge acquisition, and use of the knowledge for individual and community improvement are emerging as mutually reinforcing components of projects.

It is hoped that there will be a continuous exchange and dissemination of information among member countries through inter-country/inter-project study visit under APEID.

The work of the Study Group should lead to further examination of instructional materials produced in different countries by the countries themselves to determine the weaknesses of the materials in relation to the achievement of desired objectives. The guidelines should also serve a useful purpose in developing new curricular materials in different programmes of education.

ANNEX I

AGENDA

1. Opening of the Meeting.

2. Election of Officers of the Meeting and consideration of Agenda and Provisional Schedule of Work.

3. Review of experiences of the participating countries in the development and use of curriculum materials, teacher education materials and science instructional materials, with special reference to:

   a) common and special elements in core curricula for integrated rural development in different countries; and the methods and criteria used in identifying these core elements;

   b) strategies, methodologies and institutional arrangements (specifying groups like students, teachers, communities, etc. involved) used in the development of instructional materials for translating the core elements into teaching-learning materials and accompanying aids;

   c) training of teachers and other personnel in designing, use and improvement of the materials developed;

   d) problems and issues encountered in development or use of materials; and strategies used to solve problems and to resolve issues, at different times during the development and use of materials and their assessment for effectiveness;

   e) mechanism and procedures for continuous evaluation; and periodic renewal of instructional materials.

   (Aspects under (d) and (e) above would appear as separate sub-heads while dealing with (b) and (c) above.)

4. Preparation of draft guidelines for designing, development and use of instructional materials.

5. Visits to schools.

6. Analysis of selected exemplar materials which would be made available to the participants; and finalization of the guidelines in the light of the analysis.

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7. Draw applications for improvement of existing practices in the design, development and use of materials, and recommend ways and means of facilitating inter-country co-operation and exchange of experiences on the subject.

8. Consideration and adoption of the report of the Meeting.

ANNEX II

LIST OF PARTICIPANTS

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ANNEX III

A. LIST OF MEMBERS OF GROUPS ON SYNTHESIS OF EXPERIENCES

Group A.

1. Dr. Sergio Gasmen — Chairman
2. Mrs. Lucille C. Gregorio
3. Mrs. Meherunesa Islam
4. Mr. Supol Wuthisen
5. Mr. S.B. Ekanayake

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2. Dr. A.K. Sharma
3. Mr. Ayan Bahadur Shrestha
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5. Dr. J.S. Rajput
6. Dr. Sang Ho Kim
7. Mr. Mahmudur Rahman

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3. Dr. Tai Bom Chung
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5. Dr. Masood Sadrol-Ashrafi
6. Mr. Sudijarto
7. Mr. Chin Pin Seng
8. Dr. Rasalina T. Villavicencio
9. Mr. Swat Chongkol
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5. Mr. Chin Pin Seng
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7. Dr. Rosalina R. Villavicencio

ANNEX IV

LIST OF DOCUMENTS

Information Documents

ROEAO-78/APEID-CD-2/2.1,2.3/INF.1	- General information paper
ROEAO-78/APEID-CD-2/2.1,2.3/INF.2	- Provisional list of participants

Working Documents

ROEAO-78/APEID-CD-2/2.1,2.3/1	- Provisional agenda
ROEAO-78/APEID-CD-2/2.1,2.3/2	- Annotated agenda (Provisional)
ROEAO-78/APEID-CD-2/2.1,2.3/3	- Provisional schedule of work
ROEAO-78/APEID-CD-2/2.1,2.3/4-Bangladesh	- Experiences of Bangladesh in Developing Curriculum Materials for Rural Education by Mrs. M. Islam
ROEAO-78/APEID-CD-2/2.1,2.3/5-India	- Teaching through the Environment by Dr. J.S. Rajput
ROEAO-78/APEID-CD-2/2.1,2.3/6-India	- Experiences in Developing Teacher Education Programmes and Science Instructional Materials at the National Council of Educational Research and Training in the Regional College of Education, Mysore, India by Dr. A.K. Sharma
ROEAO-78/APEID-CD-2/2.1,2.3/7-India	- Experiences in Developing Instructional Materials for Integrated Science and Secondary Biology Curricula by Dr. B.B. Ganguly
ROEAO-78/APEID-CD-2/2.1,2.3/8-Indonesia	- The Development of Science Instructional Materials for the Development School Project in Indonesia by Mrs. Ratna Wilis Dahar
ROEAO-78/APEID-CD-2/2.1,2.3/9-Indonesia	- A Summary of Indonesian Strategy in Developing Instructional Materials for Primary and Secondary Schools by Mr. Sudijarto

ROEAO-78/APEID-CD-2/2.1,2.3/10-Iran - Science Curriculum Development and Research Experiences at Bu-Ali Sina University in Iran by Dr. Masood Sadrol-Ashrafi

ROEAO-78/APEID-CD-2/2.1,2.3/11-Rep. of Korea - Using Critical Incidents Techniques for the Identification of Teacher Competency in the Development of Teacher Education Module by Prof. Hong Kyoo Byun

ROEAO-78/APEID-CD-2/2.1,2.3/12-Rep. of Korea - Curriculum for Rural Development: Instructional Materials for the Saemaul Movement in the Republic of Korea by Dr. Tai Bom Chung

ROEAO-78/APEID-CD-2/2.1,2.3/13-Rep. of Korea - The Development of Educational Programme and Materials for Pre-Primary Education in the Republic of Korea by Dr. Sang Ho Kim

ROEAO-78/APEID-CD-2/2.1,2.3/14-Malaysia - The Development of Primary Science Instructional Materials in Malaysia by Mr. Kamaruddin bin Hussin

ROEAO-78/APEID-CD-2/2.1,2.3/15-Malaysia - Experiences of RECSAM in Developing Science Instructional Materials by Mr. Chin Pin Seng

ROEAO-78/APEID-CD-2/2.1,2.3/16-Nepal - Experiences in the Development of Curriculum Materials for Rural Development in Nepal by Mr. Ayan Bahadur Shrestha

ROEAO-78/APEID-CD-2/2.1,2.3/17-Pakistan - Experiences in Developing Curriculum Materials for Primary and Secondary Schools by Mr. Mahmudur Rahman

ROEAO-78/APEID-CD-2/2.1,2.3/18-Pakistan - The Development of Primary Teaching Kits in Pakistan by Mr. Mohammad Aslam Popalzai

ROEAO-78/APEID-CD-2/2.1,2.3/19-Philippines - Integrated Rural Development through Science Education by Dr. Rosalina R. Villavicencio

ROEAO-78/APEID-CD-2/2.1,2.3/20-Philippines - Experiences in Developing Exemplar Teacher Education Materials for Environmental Biology by Mrs. Lucille C. Gregorio

ROEAO-78/APEID-CD-2/2.1,2.3/21-Philippines - The Comprehensive Community Health Programme: Its Role in Training for Rural Development by Dr. Sergio Gasmen

ROEAO-78/APEID-CD-2/2.1,2.3/22-Sri Lanka - The Development of Instructional Materials for an Integrated Teacher Education Programme in Rural Communities by Mr. S.B. Ekanayake

ROEAO-78/APEID-CD-2/2.1,2.3/23-Thailand - Experiences on Developing Instructional Materials for Teacher Education: A Case Study of the Udorn Thani Teachers' College by Mr. Supol Wuthisen

ROEAO-78/APEID-CD-2/2.1,2.3/24-Thailand - Experiences in Developing Curriculum Materials for Science Teacher Education in Khon Kaen University by Dr. Kingfa Sintoovongse

ROEAO-78/APEID-CD-2/2.1,2.3/25-Thailand - The Curriculum Revision and Implementation Project in Thailand by Mr. Swat Chongkol

The *Asian Programme of Educational Innovation for Development (APEID)*, initiated on the recommendation of the Third Regional Conference of Ministers of Education and Those Responsible for Economic Planning in Asia (May–June 1971, Singapore) and the authorization of the General Conference of Unesco at its seventeenth session (Paris, 1972), aims at stimulating and encouraging educational innovations linked to the problems of national development in the Asian region.

All projects and activities within the framework of APEID are designed, developed and implemented co-operatively by the participating Member States through their national centres which have been associated by them for this purpose with APEID.

The 18 Member States in Asia and Oceania which have joined APEID are: Afghanistan, Australia, Bangladesh, India, Indonesia, Iran, Japan, Lao People's Democratic Republic, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Singapore, Socialist Republic of Viet Nam, Sri Lanka and Thailand.

The Asian Centre of Educational Innovation for Development (ACEID) has been established at the Unesco Regional Office for Education in Asia and Oceania in Bangkok to co-ordinate the activities under APEID and to assist the associated national institutions in carrying them out.

The aims of APEID are:

- to stimulate efforts of the Member States to improve the quality of life of the people through creating and strengthening national capabilities for the development and implementation of innovations in education, both formal and non-formal;
- to encourage the Member States to make all groups (students, teachers, parents, village and community leaders, administrative personnel and policy makers) aware of the need for relevant changes in education (both formal and non-formal) as an essential pre-requisite for the improvement of the quality of life of the people;
- to promote understanding and appreciation of the differences in educational practices and approaches of the Member States, and thereby contribute to international understanding and the creation of a new international economic order.

APEID PUBLICATIONS RELATING TO INSTRUCTIONAL MATERIALS

Available from Unesco, Bangkok

Design, development and evaluation of low-cost educational materials; report

Self-learning modules in science (Three of a longer series)

Modules on the construction of modules for: (a) Teacher education; (b) Curriculum for development

Developing instructional modules for teacher education: (a) a handbook; (b) selected exemplar modules

Selection, maintenance and repair of school science equipment; report

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* Out of stock